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EFFECTIVE TRAINING FOR OFFICE AUTOMATION

A guide for managers

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in collaboration with
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We have modified our
environment so radically
that we must now modify
ourselves in order to exist
in this new environment.

Norbert Wiener
The Human Use of Human Beings

It is generally agreed in the world of work today that the computer revolution is still in its early stages, and that it is irreversible. In a society increasingly focused on information, offices, so far relatively untouched, are now seen as ideal targets for automation.

Computers have certainly inspired fears but also hopes. Of the many office applications implemented in recent years, most have been only relatively successful, and some have been total failures. Many stretches on the road to automation are unfortunately paved with broken dreams.

This situation seemed a natural target for study by the Canadian Workplace Automation Research Centre (CWARC). Our research concluded that two myths entertained by organizations regarding the introduction of office automation (OA) should be targeted for early elimination.

The first myth: electronic data processing is easy. This is the belief that if workers show a little goodwill, all can easily master these new work instruments known as information systems. Experience has made it abundantly clear that the reverse is true. At the heart of all OA projects is the inevitable need for training, and we feel that this aspect should be promoted by all available means.

The second myth: computers are automatically efficient. Although the commonly accepted view, efficiency does not lie in the machine, but in the use made of it (which once again brings us back to training). Moreover, true gains in efficiency do not come from simply automating office machines, but from reorganizing work in order to derive the maximum benefit from the new tools.

Work cannot, however, be reorganized without the active participation of managers. This is why research workers at CWARC are unanimously convinced that work cannot be automated unless the decision-makers in an organization take responsibility themselves for the process of change. Unfortunately, these individuals are rarely well informed, and their decisions are accordingly guided more by budgetary considerations, or even simply prestige! If they are to act differently, they need tools that can help them decide effectively.

This report, which is aimed at managers, is intended as a guide to successful office automation[1] training. It goes beyond a simple description of the challenges involved in OA training and proposes a detailed procedure to assist managers.

This guide is divided into two parts. The first provides an overview of all the factors that must be considered when developing an OA training program. This complex area is delimited through the formulation of twelve interrelated principles. The second part proposes a process that involves step-by-step implementation of the twelve fundamental principles.

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[1] In our usage, the concept of "office automation" covers a fairly broad field of applications, taking in everything connected with automating office work. Although office automation is mainly concerned with a person's individual information system, it nevertheless covers all the various information systems.

An official definition adopted by the French government in December 1981 seems particularly appropriate. Office automation is defined as "all techniques and means tending to automate office activities, in particular the processing and communication of the spoken and written word and images."

The contents of this guide is the result of a research project conducted in two stages at CWARC in 1987. The first stage was to define and elaborate the twelve postulates aimed at circumscribing the area of training. These postulates were identified on the basis of the author's experience and the literature available on OA training. Next, using the twelve postulates, open interviews were held with 18 individuals responsible for OA training and implementation. This intentional sampling enabled us both to validate our research position and to enrich it. Readers wishing additional information on the methods and tools used and the conclusions of this research project may refer to the document entitled Dimensions d'un modèle de formation efficace en bureautique (CWARC publication, September 1987).

Schedule A gives a list of the persons who granted us interviews. We would like to take this opportunity of thanking them for their valuable assistance. Not only did they inspire many of the ideas presented in this guide, they all supported our conviction that training is the key factor in successful work automation.

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PART I

AN OVERVIEW OF TRAINING

Training is a complex field, and it is not easy to present an overall view of it, particularly the area of OA training. We can best achieve this by breaking the field down and emphasizing first one aspect, then another, as we discuss our twelve fundamental principles. These are the "twelve commandments" of OA training. They will be discussed individually in detail in Part I of this document. Schedule B gives a list of the principles.

TABLE I

Classification of training principles

CONTEXT

Integration (1)

SCOPE

Goals (2)
Scope (3)
Evaluation (12)

APPROACH

Person (4)
Approach (5)
Relevance (6)
Follow-up (7)
Means (8)

RESOURCES

Teaching (9)
Time - Space - Equipment (10)
Budget (11)

As Table I indicates, the principles may be divided into four groups. Thus, principles 2, 3 and 12, which deal respectively with the ultimate goals of training, its scope and evaluation, are elements of the scope of OA training. Principles 4 to 8 have to do with the individual trained, the approach to training, its relevance to needs, follow-up on training and the methods used, and are part of the approach to training. Principles 9 to 11, which concern resources, cover instructors, time, space, equipment and the training budget. Principle 1 is an isolated principle which deals with integrating training into a larger set of activities and is related to the training context.

Some of these principles hold true for any type of training, no matter in what field. Others apply only to office automation. They are all important and, together, form such a coherent set that none of the resource-persons consulted saw any need to add a thirteenth principle.

It is particularly important that the reader realize how closely all these principles are interrelated. For the purposes of our study, we must consider them one after another, but we must never forget the dynamics that link them. To illustrate this interrelation, a figure will occasionally be found in the margin to remind the reader that the idea discussed at that point is related to the content of the principle bearing that number.

1 TRAINING MUST BE AN INTEGRAL PART OF ALL PHASES OF THE IMPLEMENTATION PROCESS

Of the twelve principles underlying the implementation of OA training, the first is undoubtedly the most important, the most difficult to observe and, in practice, the most commonly ignored. And yet, whether or not training is part of an overall OA introduction process has a direct impact on how it is carried out. In either case, the context will be so different that all aspects of training (scope, approach, follow-up, resources allocated, etc.) will be affected.

Training is frequently dissociated from any overall OA implementation process because there is often no true master implementation and development plan. Activities are automated one at a time (accounting, word processing, etc.), rather than making information as a whole, its circulation and processing, the starting point. With this type of piecemeal automation, there is the risk that various work contexts will be juxtaposed but never truly integrated. People will then continue to work in the same way using new tools, whereas introduction of new technologies necessitates a complete review of work methods.

In this type of approach to office automation, training cannot help but be poorly perceived. Rather than choosing training, workers must submit to it after the equipment is installed, since they do not know how to operate it effectively. This sort of "obligatory training" tends to yield very limited results, in particular because those designated for such training receive very little preparation for it. In some cases, it can even degenerate into "panic training," where just about anyone is sent for training, and for activities that are often inappropriate to their work. This approach also masks the fact that, in certain cases, the true problem is an organizational communication or management problem rather than a training problem per se.

An implementation necessitates careful planning. Training should be seen as an essential component of the process and be planned for so it follows the various phases of implementation. The table below illustrates the difference between integrated training and training seen as an isolated act.

TABLE II

Differences between integrated training and isolated training

INTEGRATED TRAINING	ISOLATED TRAINING
- based on an analysis of the information system;	- uses as a starting point isolated OA functions;
- in line with objectives and mission of the organization;	- more or less linked to overall organizational development;
- closely examines participant needs and task requirements;	- predetermined independently of specific needs of work environment;
- may benefit from attentive follow-up;	- seen as an isolated act, with no real follow-up;
- assumes creation of organizational links between departments involved (computer, purchasing, etc.);	- conducted with no formal links between departments (leading to losses in energy and effectiveness);
- benefits from allocated resources;	- cannot count on predetermined resources;
- employees involved must receive information prior to training.	- no prior information given to employees.

With an effective training strategy, those involved should be consulted as well as informed. The role the organization assigns to training is thus indicative of the importance it attaches to the human dimension of OA. If individuals are consulted before the process of change begins, they will be more inclined to participate in the related training, which will thus be conducted more harmoniously.

The first principle of OA training (integration into the overall implementation process) extends beyond training itself and is, to a certain extent, independent of it. Many of the problems encountered during the training process are in fact due to the lack of such a process. Training seen as an isolated act is at a disadvantage from the outset. This is why the training programs available on the market have relatively little effect unless they are administered by someone inside the organization who is well versed in the implementation process and has participated in its development.

If this principle is not adhered to, the eleven principles that follow will not produce much in the way of results. In the world of office automation, the trend is to integration. This is all very well, but integration must nevertheless be organizational as opposed to merely technological if training is to be effective.

> It is of prime importance that training be integrated into the various phases of the implementation process. Without this perspective, we do not have sufficient guarantees that training can be carried out successfully.

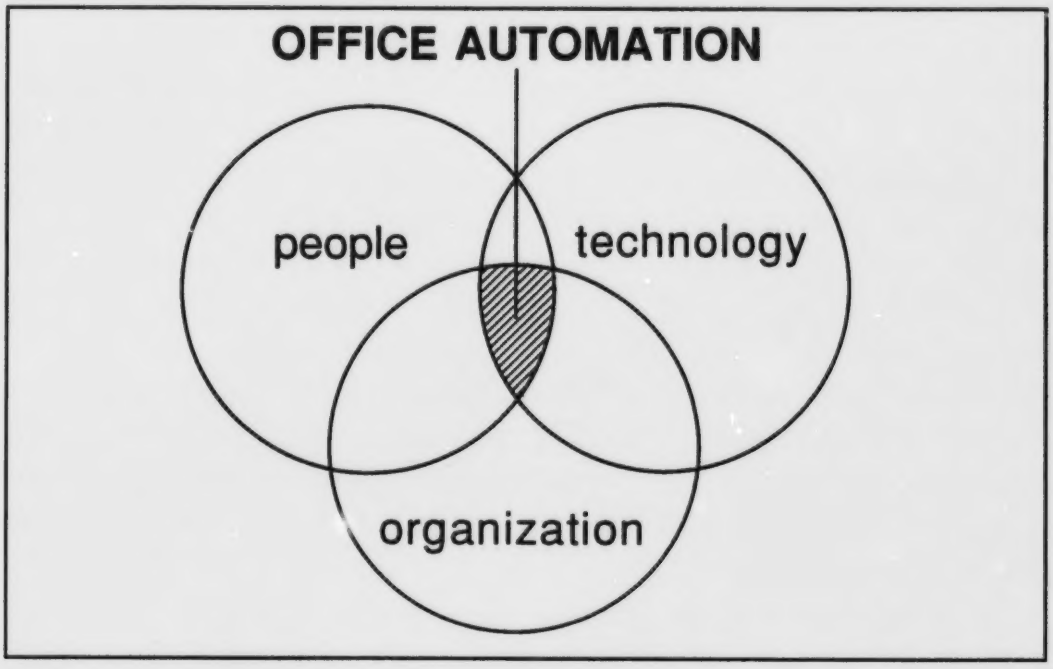
2

TRAINING SHOULD IMPROVE BOTH INDIVIDUAL SKILLS AND ORGANIZATIONAL PERFORMANCE

Office automation is a complex field, which is situated at the intersection of three key factors: technology, people and the organization.

TABLE III

Office automation, a common ground



Technology is undeniably a factor of change that must be considered, given that it is qualitative in nature rather than merely quantitative. Only yesterday, we were using single-function mechanized tools (for example, the typewriter); today we must learn to use multi-function machine systems that are increasingly integrated.

It is up to individuals to master this change. Seeing their jobs develop, change, or even disappear, they cannot afford not to take up this challenge. In a changing world, where workers must be mobile and flexible, skills are the only guarantee of stability and security. Training facilitates coming to grips with change and, to a certain extent, is an ideal way to increase one's skills. Individuals should be aware of this and consider training worthwhile to them, not just something needed to satisfy the requirements of a given task.

Mastering new tools involves the complex person-machine relationship dealt with by ergonomics. This new science is specifically concerned with adapting computer systems to individuals, both conceptually (presentation of data on video screens, help functions, etc.) and physically (space organization, furniture, etc.). In Europe, the adaptation of work to the person is considered in all its various dimensions, including social and cultural aspects. The human-technology relation is thus an important part of office automation, and will form the basis upon which we formulate other principles.

This person-machine relation is nevertheless part of a specific organizational context. The individual we are dealing with is a member of an organization, and the information he handles is corporate in nature. While the individual has specific needs, so does the organization. Work automation is ultimately aimed at improving organizational performance, and it is up to the organization to manage the proposed change and ensure that it derives benefits in terms of performance. Training too must be designed to fit the organization's needs and translate into gains in organizational effectiveness. In concrete terms, this means that the organization must continually ensure that training is adapted to the task requirements before paying for it. Unfortunately, this preventive measure is not consistently applied.

There is no conflict here between individual skill and organizational performance. On the contrary, the latter derives from the former and depends on individual motivation. Effectiveness comes not from the machines themselves, but from the optimum use of them by individuals. OA training must therefore keep this twofold goal constantly in mind.

This of course raises the question of the link between training and human resource development. Various factors can influence personnel motivation toward training, in particular:

. the relation between training and career planning;
. the impact of training on remuneration and classification.

Quite often, in the area of office automation, training is undertaken by an infocentre (end-user support service), with no participation by the human resources section. The result is that the aspects of training mentioned earlier are neglected, and problems arise.

Beyond office automation, we are dealing with the importance the organization attaches to training in general. It is certain that the employee who is offered training suited to his needs, paid for by the employer and given during working hours will have a much more positive idea of training than the employee who is merely advised to take evening courses at his own expense in an outside establishment.

> OA training should benefit both the organization and the individual. If it is tailored to job requirements, it will yield increased effectiveness for the organization. If it is part of a human resources development policy, it will promote upgrading of individual skills.

3

TRAINING SHOULD BE AS MUCH CONCERNED WITH THE SOCIAL AND ORGANIZATIONAL DIMENSION OF OFFICE AUTOMATION AS WITH ITS TECHNOLOGICAL ASPECTS

When we think of OA training, we think mainly of technical training dealing with hardware and software and aimed at mastering these new tools. It is true that most of the training given to personnel has to do with using the commands and procedures specific to the various devices and programs.

But technical training alone is not enough; it is only one aspect of the training made necessary by work automation. The reason is simply that productivity does not come just from using a tool, even if that tool is a computer. It comes from proper use of the potential of the tool, using the information circuits that characterize the work environment. Any gains are the result of reorganizing work to take greater advantage of the technologies being introduced. This is why training should give just as much consideration to the social and organizational dimensions of office information as to the technological aspect. How can this be achieved? By informing employees and providing general training at all personnel levels to emphasize these various aspects.

Automating office activities has an impact on jobs and the circulation of information. All those involved in a proposed change should therefore be made aware of the social, human and organizational impacts of new technologies. This social-organizational dimension of office automation is particularly important to managers, who are in a position to influence the organization of work to make better use of automated office equipment. Too often, these individuals are unaware of the human and organizational factors involved in office automation, and tend to leave the work of implementing change to informatics specialists. Office automation covers more than just computerization; it is just as much involved with management as with technology itself. Managers must therefore be increasingly concerned with issues of health, safety and the ergonomic environment.

By the same token, some additional general training might be envisaged to accompany job evolution and promote the development of new skills. For instance, a secretary whose job is developing to include more administrative support tasks might be called upon to use accounting software and would therefore need some training in accounting. Even the most commonly used programs give rise to problems that are more conceptual than technical. Spreadsheets present difficulties not so much in terms of mastering commands as in developing applications. In other words, the problems are expressed in terms of Why? rather than How? (what can I do better with this tool, or what new things can I do with it?) There are problems with databases due to incorrect structuring of information. Employees become confused in handling files and diskettes because they have not been trained to use a system requiring precise classification of information.

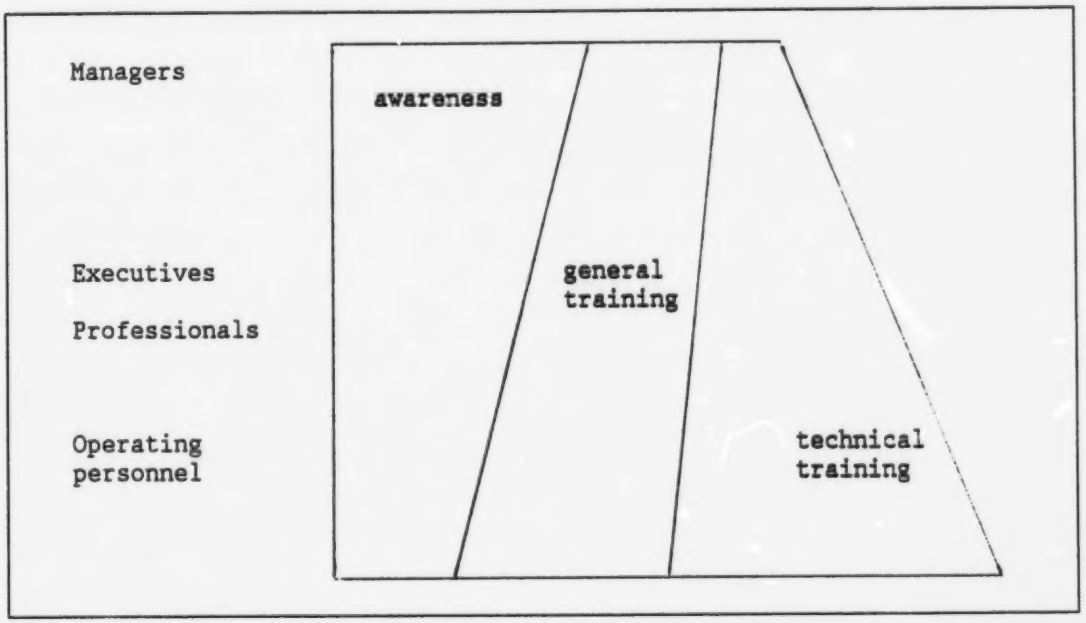
Effective use of software is often jeopardized by lack of some knowledge that is not computer-related. General training is thus needed to complement technical training so as to put an end to the widespread practice of under-utilizing computers.

For managers, who are less directly concerned with the effective use of software, this general training might be linked to managing change and conducting an office automation project.

Technical and general training and increased awareness are thus all complementary to OA training per se, and no one of them should be sacrificed in favor of another. We will, however, emphasize one or another of them at various times, depending on the type of personnel we are discussing. Table IV demonstrates that technical training is mainly of interest to operating personnel, while managers are more concerned with awareness of the stakes and social-organizational impacts. Middle management and professional staff have varying requirements for more or less equal amounts of the three types of training.

TABLE IV

Types of training and personnel categories



The scope of OA training must be broad enough to include, in addition to technical training, awareness and general training. These complementary elements of training are required by all levels of personnel, in varying proportions.

4 TRAINING MUST DEAL WITH THE PERSON AS A WHOLE: KNOWLEDGE, SKILLS AND ATTITUDES

Learning is always a new experience. It can be stimulating, but it can also be tedious and demanding, in contrast with the easiness people like to associate with computers (particularly when it comes to selling equipment!) Training makes people reassess their work habits and gives rise to a fairly normal reaction (within reasonable limits) of resistance to change.

This resistance may, however, be considerably amplified if those concerned, whether justifiably or not, feel that some of their basic needs are threatened:

- security: loss of job;
- self-development: loss of interest due to monotony of work, deskilling of job;
- autonomy: loss of control over organization of work, fear that too much is expected of them;
- self-confidence: inability to meet new requirements.

3 Paradoxically, when we look at current OA training practices, we very often remark that little attention is paid to people's attitudes. This training is technology-oriented, and gives priority to acquiring concrete skills for using hardware and software, since this approach seems to bring the most benefit in the short term. Even knowledge acquisition, which is seen as 5 supporting know-how, is considered of less importance, as we will see later on.

It is clear that involving people in the office automation process from the outset will influence their support for the project. But training may also cause attitudes to change if, throughout the process, it takes into consideration the knowledge and experience of participants.

Participants involved in training activities may have varying attitudes depending on the following factors:

- desire for training: individuals who request training are obviously prepared to invest more of themselves than those who are obliged to submit to it;

- interest in training: individuals who have received no explanation of the reason for the change with which they are confronted may not see the advantages of training and its interest and scope in relation to their jobs;

- obstacles to training: these may have to do with comprehension (problems understanding the operating logic of a program) or manipulation (fear of the keyboard is common among senior managers who do not have a professional or research background);

- training context: individuals expected to give maximum performance immediately following training may have serious learning problems.

9 These are some aspects of everyday reality that training must take into consideration. As a teacher, the trainer must encourage participants to express fears and apprehensions from the very start and be attentive to behavior indicative of fears during training. It is the responsibility of the trainer to approach individual participants, reassure them regarding the new tool and show them how it can be useful. This does not mean misleading participants with promises the trainer cannot keep; it is simply a question of making people more confident and demonstrating how automated office equipment can help them meet their job requirements.

This difficult task means that trainers must be available, and this in turn necessitates adequate training conditions in terms of number of participants and time allowed for training. It may, however, be facilitated to a great extent by a preliminary meeting or telephone conversation with individual participants, which will serve both to prepare them for the training and ensure that it will be relevant to them.

Technological change may cause individuals to be afraid and thus reluctant to accept training. Before considering the acquisition of skills, the training process should take into account the attitudes of participants so as to assist them to develop in a positive manner.

5

TRAINING SHOULD BE BASED ON A CONCEPTUAL APPROACH AND PROVIDE AN UNDERSTANDING THAT GOES BEYOND SIMPLE MANIPULATION

Ergonomics teaches us that the human being has a different relationship with the computer than with other machines because the computer deals with information rather than physical objects. As a result, using a computer system renders work more abstract. There is thus, between the individual and the work itself, a complex system and the more or less accurate mental image the person has of that system. This basic fact has been experienced by all secretaries who have traded their typewriter for a computer. With the typewriter, there is a direct relation with the finished project, since the effect produced by the type bar on a sheet of paper when the key causes it to strike can be perceived immediately, while with the computer the relation with the finished product is now indirect and must pass through a coded universe containing various devices (external and internal memory, file, screen, printer) which often appear quite mysterious to the user.

The OA training available on the market is most often based on an operational approach. It relies essentially on technical information and teaches the procedure for operating a given device or program. This gives rise to procedural-type learning, oriented to performance. "The faster the person is able to use the system, the faster the organization will show gains in productivity."

The problem with training focused on operation is that the person is not initiated into a computer culture and does not acquire sufficient understanding to be able to master the system used. The consequences: under-use of the tool (using only 25-50 percent of its potential), misuse (for example, using Lotus 1-2-3 for project management or complex database application), inability to solve problems that arise or to transfer the knowledge acquired from one program to another. This type of fragmentary, short-term training with only limited effect leaves users vulnerable when faced with the problems that inevitably arise in the course of use and necessitates allocation of more resources for follow-up.

A conceptual approach to OA training should be preferred, while at the same time not completely disregarding the operational approach. As its name indicates, the conceptual approach stresses the concepts underlying commands and enables individuals to better understand the structure of the system and how it works. This approach is broader and more integrated than the previous one; it is more skill-oriented and helps the individual develop a better mastery of the tool, greater autonomy (skill in consulting the operating manual) and the ability to transfer knowledge from one program to another.

In promoting this type of approach, are we overestimating the interest and ability of individuals? Perhaps, but those who seek instant returns underestimate them. It is clear that "computer literacy" does not mean the same thing for everyone. For the occasional user (for example, a manager wishing access to information), possessing computer literacy means being comfortable with the computer; for the everyday user (for example, the secretary using a word processor), it is the ability to do what one wishes with the computer, while for the applications designer (for example, professional developing a database), computer literacy means in-depth knowledge of the computer. In all these cases, however, no autonomy is possible without some understanding of the logic behind how the tool functions. It would then appear that the conceptual approach should at least be that preferred by organizations, since in the final analysis performance levels are always related to user competence.

A number of ways in which the trainer can encourage conceptual-type learning:

- <u>insist that commands be grouped</u> so as to give insight into the logic underlying the program; be generous with comparisons and analogies to render abstract concepts more concrete;

- <u>compare similar functions</u> of different programs (for example, block copying in word processing and spreadsheets) to promote knowledge transfer;

- <u>emphasize the generic dimension</u> of training (for example, preface training on a specific word-processing system with some training on word processing in general). The person will feel more secure about the actual operation of the tool and will have a more flexible approach to commands which, although they may vary from one program another, always activate the same functions.

> To put an end to under-use of computer tools, OA training should promote a conceptual approach. This is the only way of ensuring "computer literacy" that will render the user more autonomous.

6 TRAINING SHOULD BE RELEVANT TO PARTICIPANTS' ACTUAL WORK REQUIREMENTS

Adapting training to job requirements is of prime importance, since this determines, to a great extent, how useful it will actually be. Furthermore, the more relevant training is to participants' specific needs, the better it will capture their interest.

1 This relation is even more pronounced when training is part of a well-defined implementation strategy. Such a strategy will have resulted in an in-depth study of the situation and led to the decision to introduce technological and social-organizational changes. There will also have been a serious analysis of needs, and this will serve as a basis for the training program. A needs analysis is also useful in that it clearly distinguishes training problems from organizational problems that require other types of action.

To be valid, a training needs analysis should take a number of interrelated factors into account, including:

- the individual: schooling, degree of familiarity with OA technology, rank in organization;
- the technology: type (personal computer, terminal linked to central system, dedicated machine), degree of complexity, relevant applications (word processing, electronic mail, etc.), current uses;
- the task: characteristics (repetitive production, information analysis, problem solving), results (type of output, quantitative and qualitative aspects), OA functions required for task;
- the organization: size (corresponding resources), task-position relation and integration in larger set (department, division), extent of training needs (personnel

categories), management style and organizational climate (organization open to change or bogged down by procedures).

Only this systematic type of study can lead to adequate training, aimed at the right people.

In practice, organizations tend to skip over the needs analysis stage, imaging that this aspect can be settled by asking those involved to define their own needs, whereas they can only express more or less precise expectations. Managers are asked to select people for training without really being informed about the content of training activities. Moreover, selection is often determined by budgetary (fiscal year-ends) or organizational considerations (satisfying the employee). What is more, those responsible for in-house job training are not always well informed about office automation.

In such a context, the most common practice is to fall back on the pre-packaged training programs available on the market, preferring a "ready-to-wear" type of training which, while less costly, may contain elements that do not correspond to the specific task requirements of participants. As well, improper selection of individuals sent for training means that these persons receive inadequate training: programs may not be appropriate for their job requirements, the level of training may not correspond to their current knowledge, etc. Think of all those people who receive more advanced training without really needing it or without properly mastering basic training, or those who must learn to use application software without having first learned to use a computer and its operating system, not to mention all those who are sent for training without even having access to a computer for their work (normally, the machine is on order and arrives about eight weeks later). Since they cannot practise, they soon forget the concepts and skills learned during training. It is thus essential that there be people within the organization who can decide according to objective criteria whether a request for OA training is

justified and provide an adequate response to such requests. This is a necessary condition if we are to later be able to evaluate the training and obtain the maximum benefit from it, bearing in mind budgetary limitations. Unfortunately, training departments, and sometimes even information centres, too often act only as "order desks" for training.

Even if the training chosen is of the "ready-to-wear" type, it is possible to better satisfy the particular training needs of participants, especially when they are part of the same group. Any serious training firm will be prepared to pay more attention to the intrinsic requirements of tasks in determining what points should be stressed in training. It will use examples from work situations and develop applications that are closely related to the interests of participants. This method is particularly important in the case of flexible software (for example, spreadsheets) which may be used for very diversified applications. Group training may also be supplemented by individual consultation that will facilitate transferring the skills acquired in training to the person's actual work. Even if it results in additional costs, personalizing an existing training package really pays off.

Because it is difficult to adapt group training to participants from different work environments, it is important that the group be fairly consistent, in particular with regards to prior knowledge and personnel category. Office workers, executives and managers have different relationships with information, being involved in production, communication or management. These varied needs call for different types of learning.

To be useful, OA training must be based on an analysis of the training needs deriving from task requirements. In such a context, trainers will either opt for made-to-measure training or adapt ready-made training programs.

7

TRAINING SHOULD BE SUPPLEMENTED BY BOTH TECHNOLOGICAL AND FUNCTIONAL FOLLOW-UP

Training is the individualized, continuing and demanding process of learning. In various ways it aims to facilitate the mastery of new work tools.

Training takes place in a planned environment, a sort of laboratory, where all technological and teaching variables are controlled and where participants are guided every step of the way. But training only provides this support during the first part of the learning process, in mastering concepts and skills. Paradoxically, participants are left on their own to accomplish the most difficult part of the learning process, that of transferring what was learned in training into the actual work situation, with all its demands and specific problems. This abrupt change from the comfortable training environment to the problem-filled work environment is always a delicate stage in the learning process.

When the time comes to put into practice what was learned in training, all sorts of problems arise: technical problems, imperfect mastery of the software, limited ability to develop applications. Ill-equipped to deal with these problems, some participants yield to the temptation to give up. Most of them, however, whether out of motivation or obligation, persevere and do all in their power to find some support for their efforts.

It is unfortunate that training is so often seen as a one-time act, with no continuity. This makes it all the more difficult to use what was acquired in the training program in actual work situations. If users are to be both comfortable and productive with the tool, continuity in the training-learning process is essential. The role of follow-up is to support individuals as they continue to learn. This support should take many forms and include three aspects:

- technical: problems related to installation, system configuration, compatibility, etc.

- operational: problems related to use, mastery of more advanced functions, knowledge of short-cut commands, etc.

- development: creation of new applications, automation of procedures, programming, etc.

This type of support requires such enormous resources that large organizations often set up infocentres with the specific mandate of doing follow-up with users. Microcomputer specialists can quickly help users solve technical or operating problems and assist them in developing applications. The infocentre also has a significant regulatory role to play, ensuring a degree of uniformity in computer environments (hardware and software), facilitating data classification (individual and corporate) and promoting computer security. Depending on the number of OA functions used and the complexity of applications developed within the organization, we should be thinking of a ratio of one specialist to 25 or 50 users.

A good way to lighten the task of specialists dealing with follow-up would be to call upon resource-persons in the work environment who have received additional training and are interested in providing this kind of support. These "super-users" would be spread throughout the organization and well-integrated into their working environment, and could help with the more common and often repetitive operating problems, leaving the specialists free to spend more time on complex technical problems and new application development.

There are a number of types of follow-up, many of which may of course be combined:

- "hot line" telephone assistance;

- information and problem-sharing bulletin, either printed or electronic (if local network permits);

- individual counselling (coaching) several weeks after training;
- creation of user groups to exchange experiences and solutions to problems with a given machine or program;
- clinics for users with similar problems.

Trainers are rarely involved in the infocentre, either because they are employed in the human resources department or because they are resource-persons from outside the organization. It is thus important to provide for close co-operation between trainers and those doing follow-up, so that user feedback is constantly being used to fine-tune training strategy. Conversely, training may reveal expectations and needs that could lead to new forms of follow-up.

Smaller organizations that do not have the internal resources needed to do systematic follow-up must compensate for this with the appropriate outside resources. Concretely, this means that provision should be made in the training contract for follow-up activities that go beyond mere telephone assistance. The only really valid method is individual counselling after training.

Transferring knowledge acquired in training to the work situation is a crucial stage in the learning process. Post-training follow-up is essential and must cover a number of aspects. This type of support might be developed through an infocentre.

8

TRAINING SHOULD TAILOR TEACHING METHODS AND RESOURCES TO THE VARIOUS OBJECTIVES PURSUED AND TYPES OF CLIENTELE

There is no training method that is specifically designed for office automation and should be preferred because of its superiority. In this respect training differs little from other areas such as planning or evaluation. In a given context, one method will turn out to be better than another on the basis of the training objectives and the individuals trained. Thus training aimed at preparing senior executives to better plan, support and evaluate an office automation project will combine less formal individual activities (reading of assigned articles, experimenting with automated equipment, demonstrations of individual applications) with more formal group sessions that may include video presentations and role-playing.

Conversely, technical training designed for daily users will focus mainly on active exploration of the hands-on type. This practice-oriented method gives participants knowledge through experience, and this has the two-fold advantage of motivating the participant and facilitating memorization. Most trainers seem convinced of this, since in the OA training market, this is one of the most common approaches.

This type of learning through action may be done individually or in a group guided by a trainer. Here again, the client profile should be the main factor in choosing the type of training. With beginners, who are often intimidated by the computer, group training is generally the most agreeable, reassuring and effective method to use. On the other hand, a motivated person who already has some basic knowledge will often prefer a self-instruction method using material that is either written (manual), audiovisual (video documents) or computerized (tutorial on diskette). These resources present the advantage of being available to the user at all times, within his own work environment. Moreover, they can be adapted to the learner's own speed, allowing him to repeat or skip some elements. This is also true of computer-based training, which provides for much greater interaction with the participant. The authoring systems available on the market make it possible to develop attractive courseware (integrating text,

graphics and music), and also provide for a multiplicity of training paths through the use of sophisticated response analysers. With the interactive videodisc, it is now possible to add the realism of the television image. Participants are thus able to identify with reality, since they can be shown phenomena that are not otherwise accessible (such as manufacturing of a computer chip) and also behavior (for training personnel who will serve the public).

There is no doubt that computer-assisted training can save on learning time. This is particularly true with the videodisc. A number of studies claim that time savings are in the order of 30 to 40 percent compared to traditional training with a trainer. For there to be dollar savings as well, the numbers of trainees must be sufficiently large and/or widely distributed, in order to justify the high development cost. The work of designing software for computer-assisted training is relatively long, easily three hours of work for a minute of finished product. It may be risky to try to limit the resources invested to any great extent, since the value of the end product will be determined by the accuracy and completeness of the information it contains, and by the appropriateness and attractiveness of its presentation. It should be noted that the cost of producing a videodisc is high (approximately $30,000 for a videodisc lasting about 20 minutes), but it can be re-used indefinitely without its quality being impaired, which is unfortunately not the case of a human trainer! This type of training approach may also help resolve problems of regional disparity in large organizations with many locations.

In office automation as elsewhere, it is desirable that training methods be complementary; this aspect should be further developed. Self-teaching tools are flexible, but the examples used rarely refer to the user's work environment and problems inevitably arise for which the user has few if any answers, therefore access to a resource person is essential. The hands-on approach is ideal for teaching beginners to manipulate commands effectively, but more conceptual insight will require the use of other means: lectures/ discussions, video documents, simulation, etc. As well, it might be appropriate to use a tutorial that presents a software program as an

introduction to group training with a trainer. This latter type of training might set aside some time for directed individual learning whereby participants could spend more time on the functions they see as most relevant to their individual work situations. In some specific cases (particular learning problems, special work situations), individual training might be the only effective approach.

> OA training should tailor teaching methods and resources to the objectives pursued and the clientele involved. Training methods must be complementary if as much benefit is to be derived from group training as from self-instruction.

9

TRAINING SHOULD BE DISPENSED BY COMPETENT INSTRUCTORS WHO ARE INFORMED ABOUT PARTICIPANTS' JOB-RELATED DUTIES

Automated office tools can only be mastered through a sustained, demanding learning process. The total time and effort invested may, however, be significantly reduced if a good trainer is used. Let us look at what makes a good trainer.

The trainer is first and foremost a true teacher, someone capable of assisting individuals in their learning effort and making it easier for them. But learning is a complex area, and we are only now beginning to understand how it works and to realize that not all people learn in the same way. Depending on whether the left or right-brain dominates, learning style will be more deductive or inductive. People will use a more concrete or more abstract approach to technology. They may be more sensitive to visual or auditory stimulus, and will thus use one sense more than the other in their learning. Only a trained teacher will be constantly concerned with making information accessible to all participants, particularly by varying
8 the teaching methods used.

This presupposes that the trainer will be equipped with patience, a love of his or her chosen field, a liking for interpersonal contact and the ability
4 to establish a warm relationship, treating participants as equals. With regards to the emotional aspect of learning, only a true teacher will take the trouble to encourage, stimulate and support the learner. It is unfortunately a common error to believe that anyone well-versed in a subject can teach it to someone else.

Thus we too often see training done by technicians or computer specialists who prove to be unable to simplify technical subjects or deal with participants' problems. It is possible to be competent in one's field without being capable of establishing the type of interpersonal relationship that characterizes the teaching situation.

Trainers must obviously have completely mastered the content of the training, and must themselves be experienced users of the computer system being taught. But they must be aware that they are not there to demonstrate how much they know, nor to do things in place of participants. On the contrary, they must be able to set aside what they know or can do and let participants learn in their own way. For participants, the trainer is a work instrument whose greatest contribution comes from being able to forget himself and work to make the participants themselves the focus of the training process. Contrary to a commonly held impression that is often a deciding factor in choosing trainers, people are not looking so much for an expert as for someone who will help them progress. The trainer is basically a facilitator, even if he or she may often play other roles as well, including analysing needs, developing teaching material, counselling on procedures to be used and evaluating the results obtained.

Trainers should thus be sufficiently well-versed in technology to be able to dissociate themselves from it and place themselves at the disposal of participants. This availability will be all the more effective if trainers are informed beforehand about participants' jobs and made aware of their needs. Some basic knowledge is required about the organizational context (work environment, specific tasks, knowledge participants already have, equipment availability) if training is to be adapted to the particular situation.

It is thus the job of the human resource manager to choose between using resources available within the organization or using outside resources to provide training. This is usually not an easy choice. In-house trainers have the advantage of knowing the organization well and accordingly are able to link training closely to the specific work context. But particularly in the field of office automation, the organization does not always have someone with the required skills available when needed. Conversely, outside trainers often have a more objective view of the question and are more independent of organizational politics and structure. However, if they are

to custom-tailor training they must perform the fairly extensive work of collecting and analysing a considerable amount of data in order to adapt the training to specific needs of the participants.

This is why any organization that deals with outside resources must also bear in mind its own responsibilities. It must see to, or at least participate in, the development of precise training objectives. It must also provide adequate support for outside personnel to enable them to adapt training. This is very important since, in many cases, once training is completed, the task of following up reverts to inside personnel. In exchange, the organization should obtain specific commitments from consultants as to the training products and services provided as well as on the lead time required and the costs involved.

> The trainer is a teacher who can support the individual throughout the learning process and facilitate it for him or her. Trainers also need some knowledge of the organizational context, even if they are outside consultants.

10 TRAINING MUST BE ALLOCATED SUFFICIENT RESOURCES IN TERMS OF TIME, SPACE AND EQUIPMENT

Although training and follow-up require considerable investment in human resources, this investment will not pay off unless it is supported by sufficient resources in terms of time, space and equipment.

The most vital factor is the time allocated to training, particularly when the training is technical in nature. This is often a stumbling block, either because the total time is insufficient, or because the frequency is not suited to the pace of learning.

It is a common belief that when it comes to computers, everything can be learned in a short period of time. We still see competitive training organizations make promises like "Learn all the secrets of Lotus 1-2-3 in a single day!" a promise which they could certainly never keep. They know they run little risk of rejection by decision-makers who have already been sold on the computer through claims by manufacturers and retailers about how easy it is to learn.

The truth is quite different. Training is an on-going process that must follow various stages, each of which requires various amounts of training or practice time. Chronologically, these steps are:

- awareness, which is often in the form of generic training;
- initiation, basic training on the tool itself, after a short introduction;
- return to work, to master the tool in the actual context of work requirements, with the benefit of follow-up. This phase varies in duration depending on how frequently the tool is used, but should not last less than a month.

- more advanced skill development, for users who feel they need it. This training, which also includes counselling, complements training received and provides answers to specific participant problems. This creates a closer link between training and follow-up.

The advantage of this modular approach is that it respects the inherent progression of any learning process and allows for more flexible training management. It is quite common, at least in a limited fashion, since most of the companies concerned provide introductory (basic) training and advanced skill development.

In practice, even a sufficiently long training program will be ineffective if the pace of training is inappropriate. Time must be taken not only to train, but to give participants time to assimilate knowledge. Complete mastery of a relatively complex software program takes from 6 to 12 months of regular use. Learning will, however, be facilitated if the following four requirements are met from the outset:

- Training should be broken down into short modules

  It must be realized that a half-day of intensive technical training will exhaust the participant's capacity to absorb. This is why all software courses spread over several consecutive days end up being simply "guided practice." But this practice does not necessarily have to be part of the training course; it might just as well be done in the work environment.

  A breakdown into short modules obviously demands stricter management than training lasting several consecutive days. Once again, this illustrates the need for the organization to allocate resources to the co-ordination of these modules and not shirk its responsibility for this aspect. All in all, this type of breakdown is better for the participant from a teaching standpoint, and will thus be more beneficial to the organization, which is often absorbing the cost.

- Adequate spasing of modules

Enough time must be left between modules to practise and master what was taught. This time should not be too long, since this would break the continuity of training and erode participant interest. A period of two or three days between half-day modules is generally sufficient.

- The right number of participants

Experienced trainers know that the ideal number of participants for technical group training is from 4 to 7. Below that figure, group dynamics fail to develop. Beyond, and this is more common, the trainer cannot provide each participant with the same quality of attention. The length of training must then be increased, particularly if the group is not consistent (with respect to existing knowledge, for example).

- Good conditions for returning to work

Good training may prove ineffective if good conditions are not provided for participants returning to work. This is often the case, unfortunately, especially for support personnel who are granted little freedom in managing their time. Managers must consider the person returning from training as "newly trained," and not an expert. They must consequently accept the fact that, for about a month, that person will not be very productive in using the new tool, with the inevitable result that job performance will be lowered. They must even provide a replacement for the person sent for training, to ensure that there is no extra work pressure on the return to work.

Too often, though, the opposite occurs: work piles up, and production demands are even greater. In such conditions, there is considerable risk that the person coming back from training will abandon the new tool, which is rot yet sufficiently mastered, to fall back on the

machine used before training (for example, typewriter in the case of a secretary). Investment in training has, in the final analysis, been wasted.

Group training requires appropriate space. The room must be large enough and so arranged as to facilitate the teaching relationship. A traditional classroom arrangement is not particularly appropriate to technical training on the computer.

Training also requires some basic ergonomic conditions: furniture that facilitates long periods of screen work, appropriate no-glare lighting, adequate ventilation to maintain a comfortable temperature, and most of all, calm and quiet. In practice, the importance of these factors is considerably under-estimated, whereas if any one is lacking, this may constitute a major obstacle to learning. The same is true of the participant's normal work location, where the same drawbacks may prevent gains in productivity.

Very few organizations, except the very largest, have adequate space set aside for training. If, given this, it is nevertheless decided to hold training in-house, rooms must be set up temporarily for that purpose and the computer equipment installed; since working with equipment scattered throughout the premises can only result in demonstrations that, despite the interest they generate, certainly do not result in effective mastery of the program. Training requires more computers than does demonstration.

The advertising promise of "one computer per participant" is so common today that everyone is aware of the necessity of individual access to a computer during and after training. Accordingly, it is essential that the person being trained has access to a computer system that is already installed and working properly. Many training strategies have failed simply because the required equipment was not available when needed.

One last important resource should be mentioned: quality teaching material to support the training process. The manufacturer's manual is rarely designed to suit the user's needs. Reference material, adapted for the purpose, that is easy to consult and updated regularly will cut down on both learning time and effort.

As an on-going process that must go through several stages, OA training is ideally suited to a breakdown into short, properly spaced modules, which will facilitate the participant's return to work. Space and equipment also have a significant effect on training and learning.

11 TRAINING SHOULD BE ALLOCATED FINANCIAL RESOURCES EQUAL TO THE BUDGET FOR EQUIPMENT

Thus stated, this principle will no doubt shock many managers and cause many to protest, therefore some explanation is necessary. But we cannot explain away the basic problem: without sufficient financial support for training, we will go on seeing and deploringthe chronic under-use of equipment.

In office automation as in other areas, organizations are normally reluctant to invest in training. Managers are not always convinced of either the usefulness or the actual benefits. Consequently, there is a strong tendency to budget only for equipment cost and maintenance and make do with the minimum training provided by the seller, which is often included in the price.

In a study conducted in 1986, the Quebec government central informatics office[1] attempted to determine all the costs involved in using a microcomputer in a government office. The two main conclusions of the study are somewhat surprising:

- the three-year cost of using a microcomputer is $27,000 (50 percent the first year and 25 percent the next two);

- equipment-related costs (machines, software, maintenance and supplies) account for only one third of the total. The remaining two thirds are made up of organizational costs, that is: training, learning (lower productivity level estimated at 20 percent for two months), user support and system operation (file management, application development) estimated at 80 hours/year per user.

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[1] Quebec. Ministère des communications. Bureau central de l'informatique, Guide de planification des coûts D'utilisation d'un micro-ordinateur. (Quebec, November 1986), 25 p.

But what is the exact portion of the budget devoted to training? Direct training costs represent 5 percent ($1,160 over 3 years); however, if we take into account the salaries of employees in training (estimated at an average of $175/day for 10 days over 3 years), training actually represents 13 percent of the total budget.

The Quebec government estimates user support at $1,140 a year, based on a 1:25 ratio (one support person for 25 users). These support persons are technicians paid an annual salary of approximately $25,000. If follow-up costs are added to training costs, the total amounts to 26 percent of the overall budget.

If we consider the inherent costs of training, the total costs now amount to over a third of the total budget, which corresponds to the cost of equipment. Our principle is therefore exact if we take into account hidden costs that are even higher than the visible costs.

This Quebec government study provides one example, linked to a given context and time period. Leaving aside details of figures and practices particular to the public service, these results are similar to those obtained in other American studies, which show that training represents approximately 15 percent of all costs, and follow-up represents slightly more.

It must, however, be noted that actual practice shows that the amounts spent on OA training are normally less than 5 percent of the total budget for implementing office automation. Organizations allow an average of 0-3 days of training per employee per year (this figure is higher in large organizations).

More consistency is needed in the amounts allocated to training if we are to ensure the most effective use of the tools available. Maintenance expenses are often part of the budget for computer equipment, so why should the same not be true of training?

Since resources are always limited, it is important to make training as profitable as possible. One should exercise caution here in dealing with costs for various training methods and not jump to conclusions. Individual training with a manual or tutorial is in itself more economical than training with a trainer, provided this method is appropriate for the people who need to training. Conversely, the costs of computer-based training per se are higher, but this strategy may prove to be economical if the people being trained are numerous and widely distributed. In the final analysis, training appropriate to the needs of participants and to objectives will always prove the most profitable.

Internal training may appear less costly then outside training, but we should consider all factors:

- whether expert help is available locally - if not, the organization will have to train its own resource persons;

- the salary and fringe benefits of personnel involved;

- work time required to prepare training program.

Many hidden costs are involved, and these cannot be ignored. If we opt for outside training personnel, we must make sure that the training provided, whether customized, adapted or used as is, is consistent with the organization's operations.

To ensure the greatest benefit, training must be planned with as much care and thought as all other aspects of OA implementation.

It should be noted here that in the area of new technologies many government grant programs are available to support training undertaken by organizations. The Commission de formation professionnelle de la main-d'oeuvre (manpower training commission) is an excellent example of this. The fact remains, however, that in order to remain profitable, inappropriate

training requests must be kept to a minimum. One useful way of doing this, which is mainly used in large organizations, is to set up a system whereby any department that requests training is invoiced for it (even if there is no actual transfer of funds). This very simple method tends to have a moderating effect. Conversely, training that is free to the individual and his or her department can easily give rise to a multitude of often unjustified requests.

> Training, learning and follow-up should all be allocated financial resources corresponding to approximately 30 percent of the total cost of using a microcomputer. Careful planning of training so as to extract the maximum benefit from it is equally necessary.

12

TRAINING SHOULD BE SYSTEMATICALLY EVALUATED TO ESTABLISH ITS EFFECTIVENESS BASED ON OBJECTIVE CRITERIA

The results of training often cannot be calculated. As opposed to the purchase of equipment, for example, the acquisition of knowledge or skills is an abstract operation whose effects will only be felt in the long run. This is no doubt why many managers think that training takes up too much time, is too expensive and does not yield results rapidly enough.

It might be thought that careful evaluation of training is a normal practice. This is far from true, however; in fact, training is only rarely evaluated, because of the time and expense involved, but also because of the lack of an evaluation method. In practice, managers often limit their evaluation to determining whether participants are satisfied, believing that continued demand for a course means that it is a good one. Such a sweeping and empirical judgment is a far cry from a cost/benefit analysis. And yet, more than ever, it is up to the training process itself to prove that it is effective, profitable and thus indispensable. It is only if this is demonstrated that the additional resources needed for training, and often requested in vain, will be granted.

What exactly can we evaluate, and what sources of information are available? About thirty years ago, Donald Kirkpatrick proposed a model comprising four levels of evaluation: reaction, learning, behavior and result. We will accordingly base our discussion on this model, which is generally accepted and remains eminently valid for OA training. It should be noted that these four levels range from the simplest to the most complex, that each one builds on the previous one, and that it is not necessary to perform an evaluation at each level, even though careful planning of the training process should take them all into consideration.

At the first level, the simplest and best known, evaluation deals with the reactions of those being trained. This is basically a measure of satisfaction; based on a questionnaire distributed at the end of the process, an appraisal of participant reaction to the training can be drawn up. This information is, of course, subjective, and may in no case be used to draw conclusions about the knowledge acquired during training, much less about the actual impact of training on work.

Some problems may nevertheless be identified through this first level of evaluation. It would, incidentally, be preferable to do this type of evaluation earlier on in the process (for example at the midway point). This would make it possible to rapidly implement the required adjustments with respect to timing, points to stress, teaching methods, etc. It is better to collect written rather than less credible verbal information. Using an evaluation chart, with scales, will make it possible to classify data and keep a permanent record. It is, however, essential that all items on the questionnaire be clear and precise (avoid broad statements of the type, "I liked the course") and that scales be graduated to suit each item.

4 The second level measures the results of learning. Since training should consider the person as a whole, this learning is made up of knowledge, skills and attitudes. By administering a questionnaire before and after training, we can measure the knowledge acquired and determine whether training objectives at that level have been attained. Evaluating skills is more complicated: this necessitates the person carrying out tasks requiring the new skills in either a real or simulated work environment. Attitudes are even more difficult to evaluate, since attitudes themselves cannot be verified. Observation of new behavior will reveal any changes in attitudes. As well, while the participant's attitude during training indicates motivation, it is work behavior that will demonstrate the effectiveness of this training.

To be really useful, learning measurement should not be limited to the results obtained, but be concerned with the entire training strategy. Two points in particular should be considered: the eventual difference between the planned training and that which was actually given, along with the organizational context which may have helped or hindered training.

The measurement of learning described above is a valuable tool for evaluating and improving training, but while it yields the total training acquisition, it can teach us nothing about how this acquisition is transferred to the work situation. The third level of evaluation thus deals with participants' behavior on returning to work, to determine whether the knowledge, skills and attitudes acquired during training are reflected in the way work is performed.

This evaluation is more difficult and lengthy, for a number of reasons. First, it cannot be done immediately after training. A minimum of several weeks or even several months is needed to allow participants time to gradually integrate what they learned in training into their work. For this stage, evaluators must be fully informed about tasks. Next, for more reliable results, evaluators must use many sources of data, which may support one another. Those individuals directly involved are, of course, valuable sources of information, but so are their superiors (and even in certain cases their peers or subordinates), and outside observers, who have the advantage of being more neutral. This participation by persons from various levels is most helpful, not only because, without it, the evaluation would be much more difficult, but also because it levels out the obstacles to transferring what has been learned. Thus a supervisor who is informed about the training received by a subordinate will be called upon to facilitate use of the results of this training in the work situation. It is clear that the reverse would also be true: an uninformed supervisor would be hard put to encourage transfer and might even jeopardize it.

The results of this third level of evaluation are of direct interest to the training process. If it can be demonstrated that participants have effectively attained the required skill levels and yet these have not actually been transferred to their work, questions may be asked about the appropriateness of this training. Many factors may hinder training: objectives that are incompatible with job requirements (incorrect needs analysis), an insufficient performance level during training, or exercises that do not correspond closely enough to real work conditions. It might also be that, since the training program was developed, job responsibilities have changed. To verify one or the other of these possibilities, an evaluation is essential. This evaluation is not intended merely to judge the results obtained; the information collected will enable follow-up to be adjusted to participants' needs and thus encourage continuation of the learning process.

The fourth level of evaluation, that of organizational results, measures the impact of training on organizational performance. This task is very difficult, as it is not easy to isolate training from other variables that might influence improved performance and thus establish a cause and effect relationship. This is why it is preferable to focus the evaluation on a specific aspect of work: the impact of training on absenteeism, personnel turnover, reduction of operating costs, etc.

Cost/benefit analysis of training should be done by specialists. To do this, the organization must have developed its own performance indexes and have pre-training measurements on record. These can be compared with the new results. The difficulties inherent in such an operation mean that, in many cases, we are not necessarily seeking quantifiable results, but look only at the qualitative aspect of work. A study of individuals who have taken training courses might show that they are more efficient (they perform their tasks more easily and more rapidly than before) or more effective (they do more or better than before with the same resources). In either case, we may deduce that training has clearly had an impact on overall

organizational performance. In the near or distant future, this impact may translate into innovation: new ways of doing things, new products or new services.

Exhaustive evaluations obviously cannot be carried out overnight. It should, however, be borne in mind that evaluation may be limited to learning or to the transfer of learning into the work process. In all cases, managers and trainers must nevertheless be more convinced of the irreplaceable usefulness of evaluation. Evaluation assists us in better determining what the actual situation is, adapting to it and adjusting training activities and tools in accordance with it. At all levels of the organization (employers, employees, unions), there are reservations about evaluation. These reservations are due to a mistaken approach to evaluation that we have inherited from the school system, where it is the student who is judged. In an organization, however, it is not the individual who should be evaluated, but the training process itself. In this context, participants are called upon to participate actively in the evaluation, and to act as evaluators themselves. It is of prime importance that this perspective be officially adopted from the outset and shared by the organization's top management.

> Measurement of satisfaction, learning, transferring learning to the work situation and impact on the organization are all levels of evaluation. OA training must be evaluated, since that is the only way we can improve it and determine how effective it is.

PART II

A FUNCTIONAL PROCESS

Part I of this document described the twelve essential principles for developing effective OA training, thus answering the question "what" The second part will attempt to provide answers to the question "how" by proposing a detailed process designed to lead to the effective implementation of such training. Here again, the reader will find marginal references to the principles underlying the proposed action. It should be clear that this process, no matter how strict and detailed it may be, cannot take into account the particularities of different organizational environments, and that some adaptation will consequently still be needed.

We can easily imagine the interest with which those responsible for OA training will read this chapter. We have nevertheless addressed our remarks mainly to managers, that is, to those responsible for major decisions having an impact on the organization as a whole. We hope they will further their consideration of this question with this second part, which will show them both how complex the organization of this training is and how important their support is to its success.

As indicated in Table V on the next page, our process takes place in four phases, each of which is achieved through a number of steps. The first phase will lead to an analysis of needs, the second involves development of a master plan, the third will deal with developing training strategies and the fourth will cover implementation of the training process. Under each of these headings, the main activities corresponding to the various consecutive stages included in that phase will be discussed.

TABLE V

OA training process

PHASE I: ANALYSIS OF TRAINING NEEDS
. integrate training into an overall view of the organization . make sure that the problem is one of training . base training on participants' actual work requirements
PHASE II: DRAWING UP A TRAINING MASTER PLAN
. determine the training dimension and approach . examine internal and external training alternatives . inventory material and financial resources . clarify the contribution of evaluation and follow-up . determine the objectives and modules of the plan
PHASE III: DEVELOPING TRAINING STRATEGIES
. formulate precise training objectives . select training methods . develop training content . select participants . select trainers . develop teaching materials
PHASE IV: IMPLEMENTING THE TRAINING PROCESS
. initiate evaluation and follow-up . manage training

PHASE I: ANALYSIS OF TRAINING NEEDS

- integrate training into an overall view of the organization
- make sure that the problem is one of training
- base training on participants' actual work requirements

This first phase in the development and implementation of training is essential; it is the means by which, like an engineer, we make sure the ground on which we want to build is solid. But this is also a fairly difficult stage, demanding both time and energy. This is no doubt why we often tend to skip over it and go right into the planning of the training program. This decision might be disastrous and could even jeopardize the success of the training process.

This first phase provides for an analysis of training needs. To accomplish this, three distinct steps must be followed, these will be covered, in order, below.

Step 1

Integrate training into an overall view of the organization

A twofold analysis is required, covering the workings of both the organization and, more specifically, its information system. In cases where careful planning preceded the development of an office automation project, this twofold analysis has already been performed. Conversely, if new technologies are to be introduced piecemeal, without a master plan, it is essential to carry out this analysis and obtain answers to the following questions:

- What is the primary mission of the organization?

- What are the long-and short-term objectives?

- What is needed to attain these objectives?
- What constraints might hinder accomplishment of these objectives?
- What management style is used in the organization (authoritarian, participatory, etc.)?
- Is the organizational context stable, evolving, in a crisis?
- What is the pace of change in the organization: rapid? inconsistent? (for example, is on-going training a common practice?)
- What are the main resources of the organization?
- What information does each department need to function?
- How is this information processed?
- What are the products of this processing (lists, reports, etc.)?
- What are the main channels for exchange and communication of information within the organization?

Once again, all these questions should normally be dealt with before developing the training program. They form a sort of background on which some light must be shed if training is to be developed in line with the needs and priorities of the organization.

Step 2

Make sure that the problem is one of training

Training is a means for filling the gap between a problem situation and a desired situation. The first step is to make a diagnosis of the current situation and identify problem areas, to ensure that the solution to these problems effectively lies in the acquisition of new knowledge, skills or behavior. This diagnosis may, in fact, lead to solutions other than training: personnel transfers, introduction of new work methods, more information to personnel, etc. These changes may also complement training, and it is thus necessary to maintain close contacts between training, human resources and other departments involved in office automation (computer services, purchasing, etc.). For example, implementing a policy making it easier for employees to purchase a microcomputer for their own use will obviously have an impact on training. The very important phase of familiarization with the computer will, to a great extent, take place outside working hours, which will free up more time for the other training stages. Such a policy will also have an impact on productivity, as some people will not be able to resist the "temptation" to take home work begun in the office.

2

At this stage, it is essential that senior management participate in the diagnostic process. Not only because it is concerned, but also because it must approve the choice of training as one of the solutions to be employed. It is important that top-level managers be convinced of the usefulness of training as an instrument governing change and that they make this clear. This will be easier for them if training is designed in line with the actual needs of the organization and if it is truly aimed at increasing organizational performance. If they are aware of the importance of training, they will better resist the common temptation to cancel scheduled training at the last minute, invoking under the pretext of production requirements that make it impossible.

There are many advantages to having top-management support: it will be easier to subsequently obtain co-operation from other managers and also to request additional resources if necessary.

Step 3

Base training on participants' actual work requirements

6

Once we have made sure that training is required, we can go on to make an inventory and an analysis of training needs. Important considerations for this purpose are the tasks, individuals and technologies involved.

Tasks

- What tasks are affected by work automation?
- What are the main characteristics of these tasks: repetitive, simple or complex, important or secondary in the process as a whole, involving some critical factors such as speed, security of information, etc.?
- Are there any quantitative standards or qualitative criteria attached to these tasks?
- To what extent are these tasks likely to evolve?

Individuals

- What individuals are involved in performing these tasks?
- Do they work at different levels in the organization?
- What is the current knowledge and skill level of these individuals in terms of the proposed change?

- How familiar are they with new technologies?
- How motivated are they regarding their tasks and the proposed change?
- How is this motivation expressed in behavior?

Technologies

- What technologies are currently used in performing these tasks?
- What are the characteristics of these technologies: easy to use or complex, mono- or multi-function, etc.?
- Is the proposed change more qualitative in nature (better use of existing technology) or more quantitative (adding additional technology) or both?

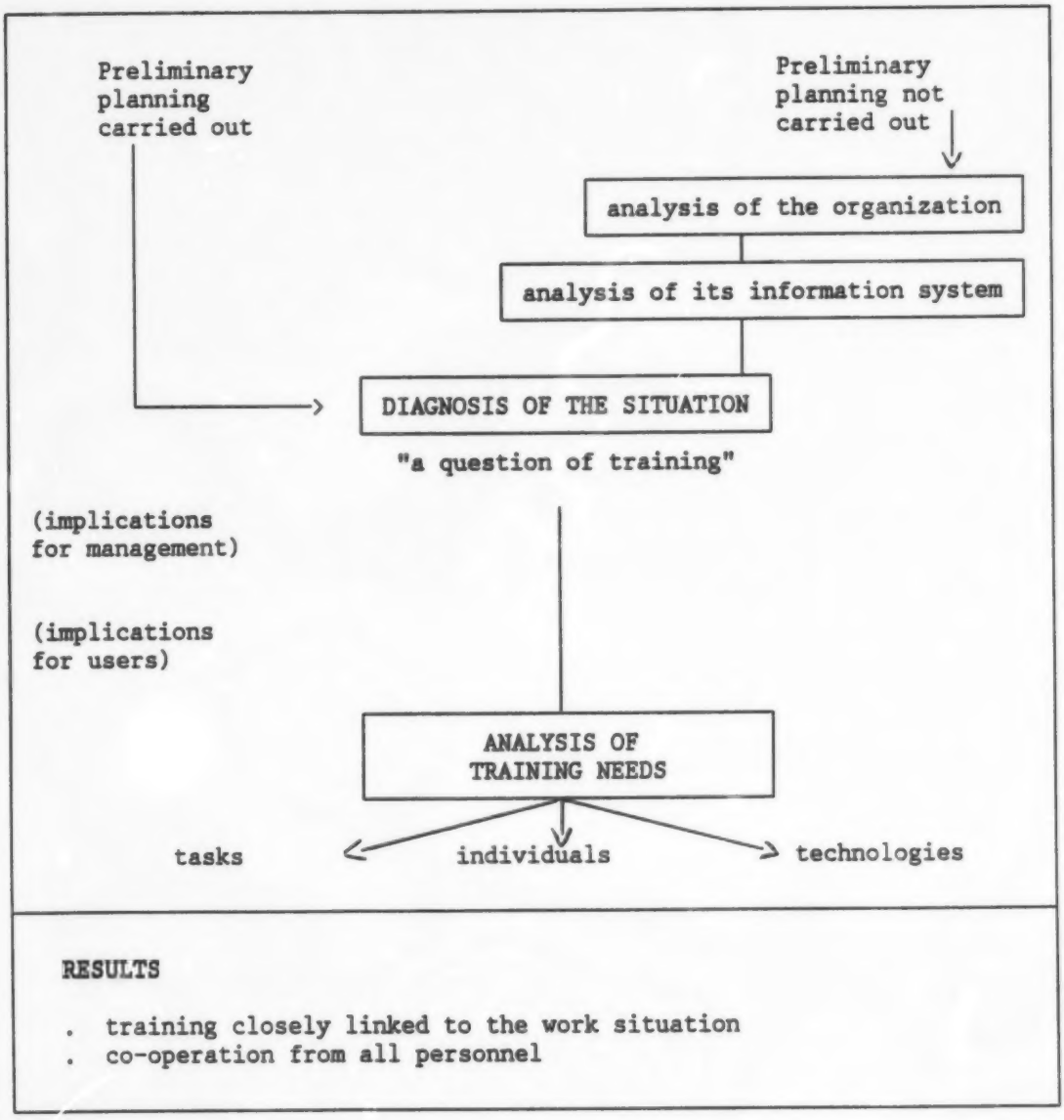
There are many methods for making this analysis: study of task descriptions, observation of operations, etc. But nothing can replace questionnaires and interviews with the people who perform the tasks and with their immediate supervisors. It should be borne in mind that what this constantly evolving situation reveals are problems. Translating these problems into needs, calls for an expert who is necessarily subjective. It is important that the expert's interpretation take into account the perception of those people who have daily experience with these problems in their work. It is no exaggeration to say that these people are a unique source of information, nor should it be forgotten that having users participate is an ideal way to obtain their commitment to change. Training provides a way for them to master that change.

The needs pinpointed and analysed will no doubt be numerous. It is thus essential to determine how these needs are organized, since one need may depend on another, and to draw up a list of priorities to guide the training process.

Once this first phase is completed, training will be well on its way with two major assets: we can be sure it will be closely related to the work situation, and that it will receive co-operation from all levels, and this will be a great advantage when the training process is implemented.

The diagram below illustrates the procedure we have followed during this first phase:

TABLE VI
Phase I: Analysis of training needs



PHASE II: DRAWING UP A TRAINING MASTER PLAN

- determine the training dimension and approach
- examine internal and external training alternatives
- inventory material and financial resources
- clarify the contribution of evaluation and follow-up
- determine the objectives and modules of the plan

Now that needs have been analysed, we can now go on to plan training as a whole using a master plan that may cover a fairly long period (two or three years, for example). This plan is specifically designed to determine and co-ordinate the various training modules, based on clearly identified objectives and respecting the priorities established in the first phase. This necessitates five distinct steps, which we will describe below.

Step 1

Determine the training dimension and approach

3

We must first determine whether equal importance is to be given to the technical and social-organizational aspects of office automation. If training is to deal with all the technical, human and social-organizational aspects, we must ensure that each aspect is translated into general training objectives. Depending on the rank of personnel involved, these objectives will deal with themes such as managing change, organizing the work environment, health and safety, eventual changes to the work process and individual tasks following technological change.

These objectives may inspire some activities designed to heighten awareness prior to the actual technical training. They may eventually translate into activities that complement general training in response to new requirements that develop as tasks evolve.

5 In order to achieve an understanding that goes beyond simple manipulation, we must next determine to what extent we want to draw upon a conceptual approach to training rather than an instrumental approach. Are we going to attempt to emphasize the concepts underlying commands to enable participants to better understand the logic by which the computer system operates and thus become more competent and autonomous? This choice would obviously have an effect on training: it would last longer, teaching material would explain abstract concepts, the reference material provided would be more consistent and the training process itself would be structured so that generic training would precede specific training.

Step 2 **Examine internal and external training alternatives**

The questions raised in Step 1 suggest another question concerning the resources upon which training can count, in particular human resources. Here we must consider the alternatives of in-house training or outside training. What are the specific advantages of the two approaches, and which will bring the best returns? These questions are often difficult for an organization to answer.

The main advantages of having resource-people inside the organization are that they are very knowledgeable about the organization, its culture and communications patterns, and that they can easily obtain the information they require. But these factors may also be disadvantages: internal resource-people are involved in the organization and thus may see only one aspect of the situation. Moreover, the very fact that they are part of the structure may hinder their action. Outside consultants have the advantage of taking a fresh look at the organization, as well as being more independent of the organizational structure. Conversely, it may be much more difficult for an outside consultant to rapidly obtain accurate and complete information.

What criteria can be used in making this choice? Obviously, the organization's policy on this issue will play an important role, but other criteria may also be invoked, including:

. expertise

This is fundamental. Can the necessary resources be found within the organization to take charge of training, whether using permanent employees or hiring additional personnel on a temporary basis? In either case, how competent are the resource-people available? Do they need any preparation and, if so, how much?

The question of expertise may also be raised regarding outside resources, principally in the case of a particular type of training, linked for example to applications or developments that are specific to the organization.

. costs involved

Outside training involves higher direct costs than inside training, and this means determining whether the necessary budget is available, under what conditions (approvals) and with how much lead time. On the other hand, the hidden costs of inside training must be considered: salaries and benefits (taking preparation time into account) and the impact on other duties which must be delegated or postponed. It should be noted here that it is never easy to estimate training costs precisely, since some expenses may vary significantly, such as the cost of producing teaching materials and travel expenses. The highest costs are normally linked to the work time required to develop teaching materials: it has been estimated that one hour of training requires 40 hours of work. This ratio may vary depending on the complexity of the subject and the expertise of the person responsible for development.

. clientele

The number of persons for whom this training is destined can influence the final decision. If the number is small, purchasing ready-made training (or simply adapting it) is no doubt the least costly solution; however, if there are many participants and training will be repeated, it should be determined if the costs involved will increase accordingly (payment of royalties, for example).

. time

When is the training required? How much time is available to prepare it? Tight schedules sometimes make it necessary to call upon outside resources. If training will be repeated, however, there must be some guarantees that inside resources will always be available to give it.

These questions are a good indication that there is no pat answer to the internal/external alternative. This alternative may, however, be perceived with greater nuance if we envisage a combination of the two. The organization could then give inside resources the job of ensuring that training runs smoothly, while calling upon outside resources to determine the content. Adapting ready-made training to the organization's needs may be done jointly by consultants and inside resources. Training may even be developed in-house and given by outside resources. The governing rule is never to delegate one's own responsibilities to outside personnel. Since learning is an on-going process, internal personnel must be the ones to plan and administer training. Once this basis has been established, help may be obtained from outside resources, which now provide increasingly diversified services. Apart from specialized consultant firms, there are the growing number of free-lance trainers, some resources from the educational field and professional associations.

When the organization opts for outside training, how should it choose the firm or consultant? How can it check on qualifications and ensure that the services provided will be satisfactory? There are two factors that can assist the organization in its choice: references and a written contract.

References

Given the abundance of external resources and the variation in quality, it is helpful to ask the advice of other people, both managers and professionals, in order to benefit from their experience in this field. A recommendation from a peer is all the more valuable because it comes from someone who is disinterested and who has had a similar experience. Membership in professional associations and participation in conferences provides access to people who can help with this choice.

When negotiating with a supplier of services, particular attention should be paid to the following four points:

- record

  How many years of experience does this supplier of services have? Who were their customers, in particular those with similar needs? It might be useful to contact these customers and obtain an assessment of the services they received. They might indicate, for example, whether the supplier fulfilled their mandate and respected deadlines.

- expertise

  Will the supplier furnish the required training themselves or call upon other resources? If they simply act as an intermediary, their interest and involvement will be fairly limited. Some check must then be made of the competence of the person who will actually be responsible for training.

- adaptability

  Will the supplier be prepared to adapt their training products to the specifications of your organization if necessary? If they seem reluctant, it might be better to look elsewhere. Bear in mind, however, that adapting teaching material requires time and the cost of training will be increased accordingly.

- co-operation

  Will the supplier be willing to co-operate with you? Will they accept your participation in the training program or will they demand a free hand? Do you feel they will be flexible?

Written contract

If you have obtained satisfactory responses to the above four points, you may proceed with confidence. It would, however, be wise to draw up a written contract clearly specifying the following points:

- the supplier's mandate (and your own if appropriate)
- the nature of anticipated activities or products
- a detailed timetable
- the costs involved with terms of invoicing and payment
- conditions for changing the contract if required

Step 3

Inventory material and financial resources

10 It is important to consider not only human resources but also material resources such as equipment, space, time and money. These four determining factors will also influence the choice between internal and external training.

. equipment

Is enough equipment (hardware and software) available both for training and for the everyday work of the people affected by training? If not, is there a schedule of planned acquisitions over the short and long term? Availability of equipment during and after training must be a prerequisite to implementation of any OA training program.

. space

Will there be access to space arranged especially for training? Internal training cannot be envisaged without an appropriate location set up in accordance with basic ergonomic criteria.

. time

Will is be possible to obtain assurance from the managers concerned that employees sent for training will be released from their regular duties (during and after training) to an extent that will facilitate their training? At this stage, it is important to obtain an agreement in principle that takes into account the constraints under which these managers operate and sets out the mechanisms by which employees at training courses are temporarily relieved of their duties with as little negative effect as possible on productivity. Examples would be minimum lead time required, special restrictions pertaining to certain periods of the year, etc.

. money

11 It is a well-known fact that "money is the sinews of war." Training is no exception: the very scope of the master plan will depend on the budget allocated to training. It is thus essential at this stage to know what funds are budgeted for training for the coming two or three years and, if necessary, bring the maximum persuasive pressure to bear in order to obtain more. To make the best of budget limitations, it may be useful to determine eligibility for various government subsidy programs, particularly in the area of work automation.

Step 4

Clarify the contribution of evaluation and follow-up

To better define training objectives, we must clarify the role of evaluation and follow-up by answering the following questions:

12 . What type of training evaluation is planned: evaluation essentially focused on the measurement of results (summative) or an evaluation in the course of the process that may result in adjustments (formative) or perhaps a combination of the two?

. How far-reaching will the evaluation be? Will it attempt to verify transfer of knowledge and skills from training into work? If so, co-operation will be needed from department heads. Is there interest in going further and measuring the impact of training on the performance of the entire organization?[1] If so, the organization should

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[1] Readers wishing to make an evaluation at this level may refer to the guide prepared by Natalie Kishchuck and Judith Légaré, entitled Evaluating Your Office Automation: A Guide for Managers in Medium-Sized and Large Organiations (CWARC, July 1987). This guide suggests a detailed procedure for identifying, measuring and presenting the costs and benefits of office automation.

already have performance indexes, and performance levels should be established before training begins. For practical purposes, it is preferable to focus the evaluation on a limited number of key questions (a maximum of ten), dealing with measurable elements. Due to its complexity, this type of evaluation obviously calls for time and resources and cannot be undertaken without a firm commitment from top management to investing effort in this undertaking.

7 . How can follow-up sustain and prolong the effect of training? This obviously requires setting up a follow-up structure, without which training personnel themselves would have to follow up with users.

. Will follow-up deal only with technical aspects, or will it also be concerned with operating problems and application development? How will training and follow-up activities be harmonized? What exchanges of information and types of co-operation are envisaged between the two? Whether or not those responsible for follow-up are consulted in drawing up this master plan is in itself significant.

Step 5 **Determine the objectives and modules of the plan**

The training dimension and approach have been determined, resources have been allocated and the potential contributions of evaluation and follow-up have been identified. It is now possible to define the objectives of the master plan and then identify the various modules or courses required.

We are obviously speaking here of general objectives. Specific objectives of detailed activities will be dealt with in the next phase. Care should nevertheless be taken since, even if they are expressed in general terms,

the objectives of the master plan should be expressed in a precise way. "Increase organizational performance through office automation" may be a long-term goal, but is not an objective that can be made operational. We might, however, think of objectives such as "Prepare the managers in the steering committee to effectively manage the process of OA implementation," or "Train personnel department secretaries in the X word-processing system," or else "Make first-level management aware of the impacts of technological change on work organization."

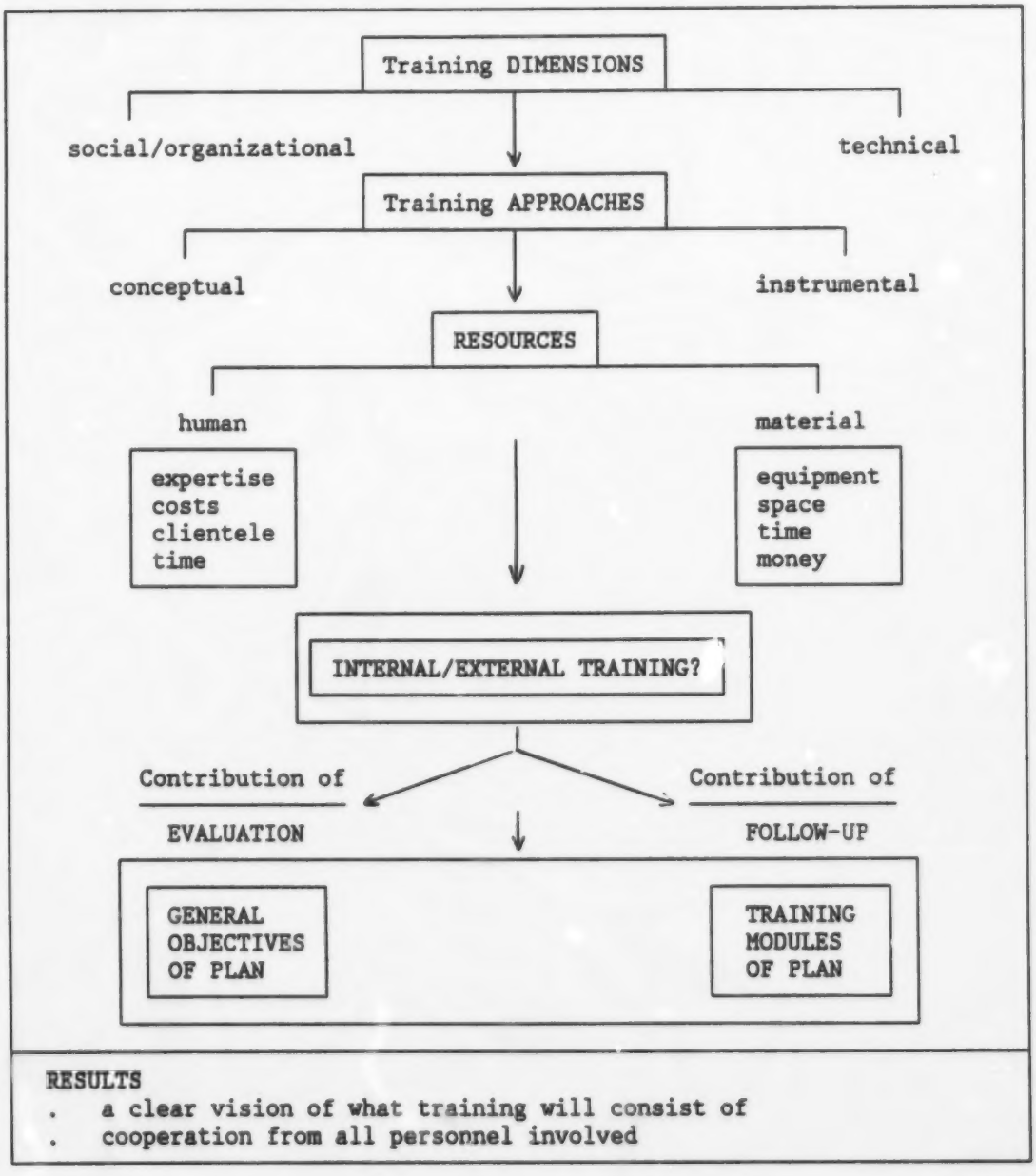
These objectives may then be translated into training modules. For each module, the following elements may be determined:

- department involved
- type of personnel (managers, secretaries, operators)
- type of training planned (awareness, technical training, general training)
- prerequisites
- duration
- resources involved (internal and/or external)
- cost
- degree of priority of module (for the organization)

At this stage, it is not always possible to determine the precise duration and cost of each module. This should not cause too much concern, since these aspects will become clear as time goes by. The most important thing, for the time being, is to have an overall idea of the orientation of OA training for the medium term. This second phase also makes it possible to increase co-operation from those whose support is needed for the training process: heads of departments whose personnel will be most affected by training, those who will be responsible for follow-up and certain managers particularly concerned with training or office automation, such as the vice president of human resources, the manager of the personnel department and the manager of computer services.

The diagram below illustrates the procedure we have followed during this second phase:

TABLE VII
Phase II: Drawing up a training master plan



PHASE III: DEVELOPING TRAINING STRATEGIES

- formulate precise training objectives
- select training methods
- develop training content
- select participants
- select trainers
- develop teaching materials

With the master plan completed, it is now possible to prepare specific training activities for the months to come. These activities, developed on the basis of the priorities previously determined, will vary in number depending on the resources available. A particular training strategy will have to be developed for each activity, based on the type of training envisaged, target clientele, number of people involved, etc. This third phase is designed to develop adequate training strategies.

We are no longer working at the overall level of the master plan, but rather at the tactical level of organizing training activities. Here too, various steps are involved, and these are described below.

Step 1

Formulate precise training objectives

It is important to attribute specific training objectives to each training activity (course or module). The needs analysis carried out in Phase I should facilitate this task.

These specific objectives should clearly express the results expected from those who participate in the training program. To ensure that these results translate into behavior that can be verified, objectives should be formulated in such a way that they are observable and measurable. Thus "Understand the merge function in word-processing" is a praiseworthy objective, but it is too vague and does not reveal what form this understanding will take nor how to evaluate it. Instead if this objective is formulated as follows: "Merge a form letter with a file having five variables," this is more in line with what the learner should be able to do, and this skill can then be verified.

We can go even further and state the conditions for using this skill and the level of performance deemed acceptable. Our objective might then be reformulated to read: "Using the form letter provided, perform a merge with a file containing five variables, with no errors."

The golden rule is then to establish precisely what the person will be capable of doing at the end of the training program. To achieve this, objectives should be expressed using action verbs, leaving aside verbs such as "know," "understand," "become initiated ...," preferring "identify," "list," "compare," "solve," etc. This type of formulation better describes the requirements of the task while facilitating evaluation. It should be borne in mind that the efforts expended in better defining objectives will result in easier and more precise evaluations.

This approach is more appropriate to the acquisition of skills or knowledge, and is more difficult to apply in the case of attitudes. An objective such as "Have a positive attitude to word-processing" presents a problem, since it simply describes a state of mind that cannot be verified. It would be better to translate this objective into various concrete actions such as "List five advantages of the word-processing system currently used by secretarial services" or "Describe a possible positive impact of word-processing on your current work."

Step 2 **Select training methods**

Objectives clearly illustrate the aims of training, but they do not explain what procedure is to be followed. We must then look at how to attain these objectives. Answering this question means we must choose one or more training methods appropriate to the objectives pursued.

Teaching strategies are numerous but may nevertheless be divided into two main orientations: self-instruction and group teaching by an instructor. For each course planned, one or the other of these approaches must be adopted. Various criteria must therefore be considered:

- number of people involved and how they are grouped

  First, the immediate and future clientele for the training activity must be considered. Is training aimed at a large or small group of people? Is this activity likely to be repeated? Are the people in the same location or spread out? A large number of people, repetition of the course and wide distribution would make self-instruction preferable. Conversely, a small group and a one-time activity would not justify the high cost of developing computer-assisted training or an interactive videodisc.

- lead time to start the training program

  Unless a commercial product is used, individual training involves developing, testing and validating teaching material, and this work may take several weeks or even several months. If training is required rapidly, this option will have to be rejected.

. type of training envisaged

The various training strategies are not equally applicable to attitudes, knowledge and skills. Table VIII on the next page is an attempt to define what characterizes each of them. The symbol + indicates that the major emphasis is on this dimension of the person, while a (+) indicates minor emphasis, and no sign at all means minimum or no contribution.

The most striking point in this table is the fact that most self instruction techniques only rarely have an effect on attitudes. In this respect, the interpersonal relation is irreplaceable. But self instruction facilitates the acquisition of knowledge and skills insofar as it can be adapted to the user's working conditions and speed of learning. Group training may, in some cases, promote a change in attitudes, but its main contribution is the acquisition of knowledge, except in cases of hands-on instruction, where the prime consideration is learning skills.

TABLE VIII

Impact of various training strategies

	ATT.	KNOWL.	SKILLS
SELF-INSTRUCTION			
. tutorial on diskette		(+)	+
. video document		+	+
. manual		+	(+)
. reading articles and books		+	
. computer-based training		+	+
. interactive videodisc	(+)	+	+
GROUP TRAINING WITH INSTRUCTOR			
. presentations and lectures		+	
. demonstrations and plant visits	(+)	+	
. hands-on sessions	(+)	(+)	+
. group discussions and seminars	+	+	
. role-playing	+	(+)	
. case studies	(+)	+	
. games and situation simulations	(+)	+	(+)

The training strategy chosen should thus be appropriate to the objectives pursued: for an activity aimed at making people aware of office automation and its impact on work organization, we would use presentations and demonstrations that leave room for discussions and exchanges of views. For technical training on a specific program, we might start with a tutorial and go on to hands-on group training sessions.

. profile of individuals involved in training

The degree of familiarity and level of knowledge participants already have may influence the choice of strategy. Unless the choice is one of the new advanced technologies (computer-based training, videodisc, etc.), self-instruction is normally better suited to people who already have some basic training, whereas the presence of a trainer is desirable for beginners since it tends to reassure them.

We have not considered the fact that training may also take place right in the workplace; this is the case of the person who asks for help as needed from a more experienced colleague. Although this type of activity is very useful, it is more related to support than to actual training.

We should emphasize the fact that the various training strategies are not really opposed to one another, and it might often be desirable to combine them. The individual or group orientation is then replaced by a combined approach alternating both types of strategy.

Step 3 — Develop training content

Specific objectives distinguish what is covered by training from what is not. It is then a simple matter to establish the content of each training module enabling these objectives to be attained. An effective way to do this is to break the subject down into elements of information, each of which may be used to present, explain or demonstrate a particular

point. These elements should be arranged in a logical sequence, from the simplest to the most complex. At the same time, it is possible to construct practical elements that will be used for experimentation at various stages in the process. It is also possible to construct testing elements that will verify the accomplishment of training objectives at strategic points during the program.

To properly link the various elements together, it is important to determine how training is to be spread out over time, especially in the case of group training. Here again, the strategy will vary with the type of training. Awareness of office automation and its impact may very well be dealt with in intensive sessions over a day or two, while technical training benefits from being spread out in half-day sessions with adequate time for individual practise between them. General training is better given outside the organization, using a long-term approach (for example in an educational institution).

On the basis of this breakdown of training over time, we can bring together the various elements of information, practice and testing. Care should nevertheless be taken to ensure that the three types of elements are present in each sequence. All the information needed to understand should be presented, although there should be no superfluous information, while practice elements should be numerous enough to allow for proper absorption of knowledge, without making the progression unnecessarily cumbersome. Test elements should only be used at key moments, and should cover only the information immediately preceding them. There must also be a balance between sequences, particularly with regards to dividing up the more complicated concepts and the more demanding skills, in order to ensure that the pace of learning remains constant. Persons undergoing training should not be confronted with sequences presenting too many or not enough learning problems.

Developing training content, just like defining specific objectives, may call for help from specialists in the field. The manager in charge of training is not necessarily a specialist in this area and cannot always devote the necessary time to this work. These tasks in fact involve a considerable investment in terms of work time.

Step 4 — **Select participants**

The time has come to identify the people who will receive training and register them, either for self-instruction or group training. In co-operation with the head of the administrative unit, an estimate should be made of the relevance of the various training requests. To do this, motivation should be determined at two levels:

. individual motivation regarding training

4 It is inappropriate to send people for training who, for various reasons, are opposed to this and have no interest in it. It would be better to wait until they feel the need for training before registering them. Seriousness of motivation may be verified by stressing the efforts required by training and, particularly in the case of technical training, the obligation to practise regularly. As a consequence, people should not be registered for training at times when their work is particularly demanding. In some organizations, the individual will be asked to prove this motivation by making some contribution, no matter how small, to the cost of training.

It is clear that the organization's general policy on training will influence the individual's motivation. If training is part of well-planned human resources management, if it is linked to the individual's career plan, and if it has an effect on remuneration or classification, then the individual's interest will very likely be stronger.

. motivation of the unit that sends the individual for training

The department or administrative unit that sends the person for training must obviously be convinced of the usefulness of this training. Furthermore, the department head should be able to foresee concrete applications that will benefit the department once training is completed. This presupposes that the training activity chosen is appropriate to the job requirements. If managers and supervisors have, as anticipated, participated in the earlier stages, training should naturally correspond to tasks. It is at this stage as well that negotiations should begin with the department head to lighten somewhat the workload of the person sent for training, to ensure that he or she has enough time to learn properly.

10 In group training, registrations will lead to the formation of training groups, and criteria such as numbers and similarity of participants should be satisfied. Thus, while an awareness program might bring together up to fifteen people, technical training normally becomes less effective if numbers exceed seven or eight. It is also essential that the existing level of knowledge of participants be similar, and it is preferable to ensure that participants come from similar levels in the organization.

It is useful for the person in charge of training to meet with participants beforehand, either individually or as a group, or at least that there be some preliminary exchange of information, whether orally (by telephone) or in writing. In addition to answering questions, this contact will enable that person to get to know participants better and detect any problems they may eventually experience.

Step 5

Select trainers

9 In Part I of this document, we saw that a good trainer should have two essential skills: the ability to create a friendly teaching climate in which the person who is learning will feel confident, and the ability to simplify and interpret information to render it accessible to all. Trainers should be selected on the basis of this approach.

Other factors must also be considered: mastery of the course content, knowledge of participants' work situations and the trainer's talent as a facilitator. These three factors are present in any type of training, although in varying degrees. Training mainly aimed at acquiring knowledge will depend more on the "expert" nature of the trainer, while training that focuses on acquiring skills (operating a software program, for example) will call more upon the trainer's talent as a "facilitator." Awareness activities, which are more concerned with participants' attitudes, use the trainer's leadership ability. There is an unfortunate tendency to overstress the "expert" aspect, to the detriment of the two others, whereas a good trainer should successfully combine all three skills.

The manager responsible for training should also prepare the trainers, particularly, and this is often the case, if they have not been involved in the preliminary stages of needs analysis and development of the master plan. It is this person's job to see that trainers are well informed, particularly with regards to participants' duties and the specific objectives of training. If trainers are from outside the organization, they should receive information on the organizational situation and prospective participants. The manager should also ensure that trainers are familiar with the teaching materials to be used.

A harmonious relationship between trainers and the manager responsible for training is essential. This can be achieved if the roles and responsibilities of all are clearly defined, along with their expectations. Mutual confidence and good communications will prevent many ambiguous situations and do much to smooth out differences.

Step 6 — **Develop teaching materials**

Development of teaching materials, which is the last step in this third phase, should be undertaken with care, since these materials are the ultimate means of facilitating learning. They form a sort of immediate interface between the individual who wishes to learn and the object of his learning. In a self-instruction context, they are of crucial importance, since training depends entirely upon them. In addition to great clarity, simple language free of technical jargon and a logical progressive approach, teaching materials should have two basic qualities: they should be adaptable to the individual progress of the user, through an interactivity that enables them to "react" to the responses they receive, and they should provide a pleasant, motivating work environment.

Group training also calls for teaching materials. Although the trainer is the principal training agent, use of various audio-visual resources will enhance the effectiveness of training. These are, unfortunately, often neglected or poorly used, and this is why we feel it is useful here to recall their main characteristics. Among the resources that can assist the trainer are:

- a chalk or marker-board

  The best known and oldest tool, the board is characterized by its immediate nature: it can be used to write down or illustrate a given point at the desired moment.

Writing key concepts, definitions or questions on the board focuses the attention of participants while slowing down the instructor's delivery. The board is a useful tool, provided it is not abused.

- transparencies (with overhead projector)

Transparencies are used to present schematic representations of reality. They are ideal for simple drawings, graphs, flow charts or tables. One advantage of them is that they force the originator to simplify and organize the information to be transmitted.

There is a new trend towards combining a computer and an overhead projector to project the contents of the screen; however, the definition obtained is generally poor due to the electronic nature of the original image. In any case, the information should be kept to the essential and shown graphically. Never use continuous text!

- slides

As opposed to transparencies, slides show a true image of reality; however, they cannot reproduce movement. This fixed image is in fact an advantage when we want to show different aspects of an object or phenomenon, using a variety of angles and colors (for example, a computer chip). Nowadays, slides are increasingly used to transmit concepts, particularly because this medium can be used for computer-generated "images." In such cases, as for transparencies, excess text should be avoided and the information should be presented graphically.

- electronic presentation

This is a presentation on computer, produced using software such as STORYBOARD (IBM). This type of software, which has highly advanced graphics capacity, may be used to construct a series of images (a sort of story), in which information may be presented in an aesthetic or

even spectacular manner using the various linking and animation techniques. The danger here is that of being carried away by the technique and forgetting that form should never be a substitute for content. Use of such resources should be justifiable, and the presentations should be as dignified as possible.

. video documents

Video can obviously recreate audio-visual reality with all its movement. It can thus render all the complexity of actual reality and satisfactorily illustrate many phenomena that are difficult to grasp (production of a magnetic diskette, for example), as well as human behavior (for example, employees faced with the use of new technologies). Moreover, video can reproduce everything: photographs, slides, transparencies, film, or electronic presentations. Thus an animated film showing how the computer works may then be used in the form of a video.

It is essential that the video document be properly integrated into the teaching process, by clearly identifying the role it plays, whether as a trigger document (presenting a situation which will then be discussed), a notional document (explaining a concept), or a synthesis document (giving an overview of a situation following a preliminary explanation).

. Fixed material

It may also be helpful to use large-sized teaching materials that can be permanently displayed. These would normally be in the form of posters mounted on cardboard and laminated, serving to remind participants of essential information. Thus a software training course might involve charts showing the main commands used in the program, often associated with the appropriate function keys on the computer.

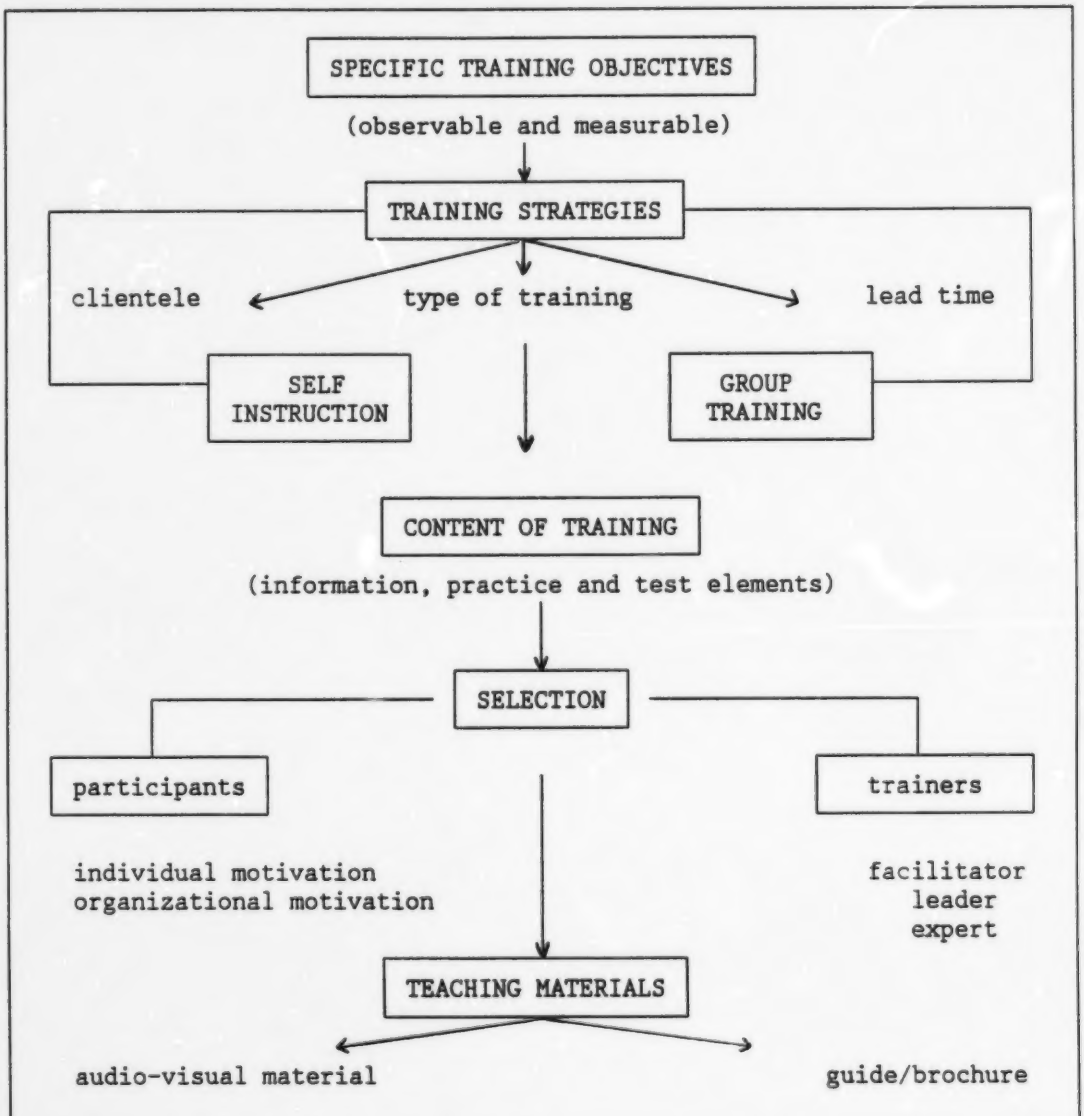
In addition to audio-visual material, participants should receive a guide or quick-reference chart that they can keep after the training is over. In the case of self-instruction, all the information may be in magnetic form (diskette or video document), but it would nevertheless be useful to add a short brochure that briefly describes the objectives and plan, and gives suggestions on putting the course material into practice. In group training, the role of the accompanying document will vary depending on the type of training. If training is oriented towards concepts (for example, a day-long session to promote awareness of office automation and its impacts), it would be useful to give participants a folder containing the following: a text summarizing the key ideas of the training session, copies of all the tables and transparencies used during the course, a glossary of the main terms mentioned and a selective, annotated bibliography. In a technical training program aimed at acquiring skills, the participant's guide should instead provide a detailed recap of the learning approach followed by the group. This type of guide means that participants do not have to take notes and thus allows them to direct all their attention to the computer keyboard. In addition, it enables them to review the procedures followed in the group on their own, once the training course is over.

It is preferable (and even indispensable in the case of self-instruction) to test the teaching materials by submitting them to a small number of people with a profile similar to that of the prospective participants. These volunteers might, for example, be able to identify weaknesses that would interfere with the learning process.

Once this third phase is complete, the manager in charge of training can consider that nothing has been left to chance and be confident that the training, which is about to commence, will be conducted successfully.

The diagram below illustrates the procedure we have followed during this third phase:

TABLE IX
Phase III: Developing training strategies



RESULT

. training is ready to begin

PHASE IV: IMPLEMENTING THE TRAINING PROCESS

- initiate evaluation and follow-up
- manage training

Despite the confidence we may feel, there is always some uncertainty about training. How will participants receive the training activities? Will technical and organizational problems interfere with training? It is thus wise to supervise the start-up of the training program. There are two steps to this, which are described below.

Step 1 — **Initiate evaluation and follow-up**

12 To guard against the unexpected, the training process should be followed closely and rapid action taken if changes become necessary. This is the highly important role of formative evaluation, which continues throughout the program. Questionnaires, observations and informal discussions with participants are all ways in which a serious assessment can be made of the reception of training and its various components (content, method, pace, trainer, teaching materials, etc.). Once the training activity is over, the learning acquired will be measured by identifying the actual contribution of training in terms of attitudes, knowledge and skills (summative evaluation).

The first training session is always a trial run, and it is normal that changes are made once it is completed. If measuring satisfaction and learning indicates that at least 80 percent of participants have attained the objectives set, the goal is attained. If the results are lower, this should be cause for concern. Once we have made sure that the training given corresponds to that which was planned, we must attempt to identify problems that hinder training. Individual meetings with both trainers and participants may be necessary to achieve this. If it happens that there is significant variation between the training provided and that which was planned, it is essential to determine why this occurred.

7 Initiating follow-up from the moment training starts is just as important as evaluation. Once they go back to work, people who have received training will first have operating and technical problems, and then problems in developing applications. These individuals must be able to easily obtain answers to their questions (for example, using a hot-line). As seen in Part II, follow-up mechanisms should already have been set up. At this stage, it is important to ensure that there is contact between persons responsible for training and those in charge of follow-up. Follow-up will quickly detect any weaknesses in training, while training makes it possible to identify participants who have the potential to become super-users. Training and follow-up are, it will be recalled, two aspects of the same phenomenon.

Later, we shall attempt to determine whether what was acquired in the training process has been transferred to the work situation. This other level of evaluation is important because it enables us to ensure that training responds to the changing demands of work.

Step 2 **Manage training**

Managing training goes beyond the purely operational problems of organizing groups, hiring trainers or reserving rooms. In fact, there are four distinct tasks that come under this responsibility:

. quality control

Uniform quality of training activities calls for supervision of all the various aspects of training: knowledgeable selection of participants, quality of trainers' work, relevance of teaching materials, accuracy of evaluation techniques, usefulness of follow-up, etc.

. updating training modules

The evolution of the context and inherent needs requires that training be regularily updated, otherwise which it will rapidly become obsolete. We only have to think of how rapidly the various versions of a computer program become available, thus obliging technical training personnel to constantly adjust the training program.

. developing new training modules

Tasks also change, and new needs appear that make it necessary to develop new training modules. In fact, new training products should be constantly being developed. Moreover, if the organization remains on top of information about new OA technologies, the training manager can then keep one step ahead of the needs expressed by the target clientele.

. identifying new resources

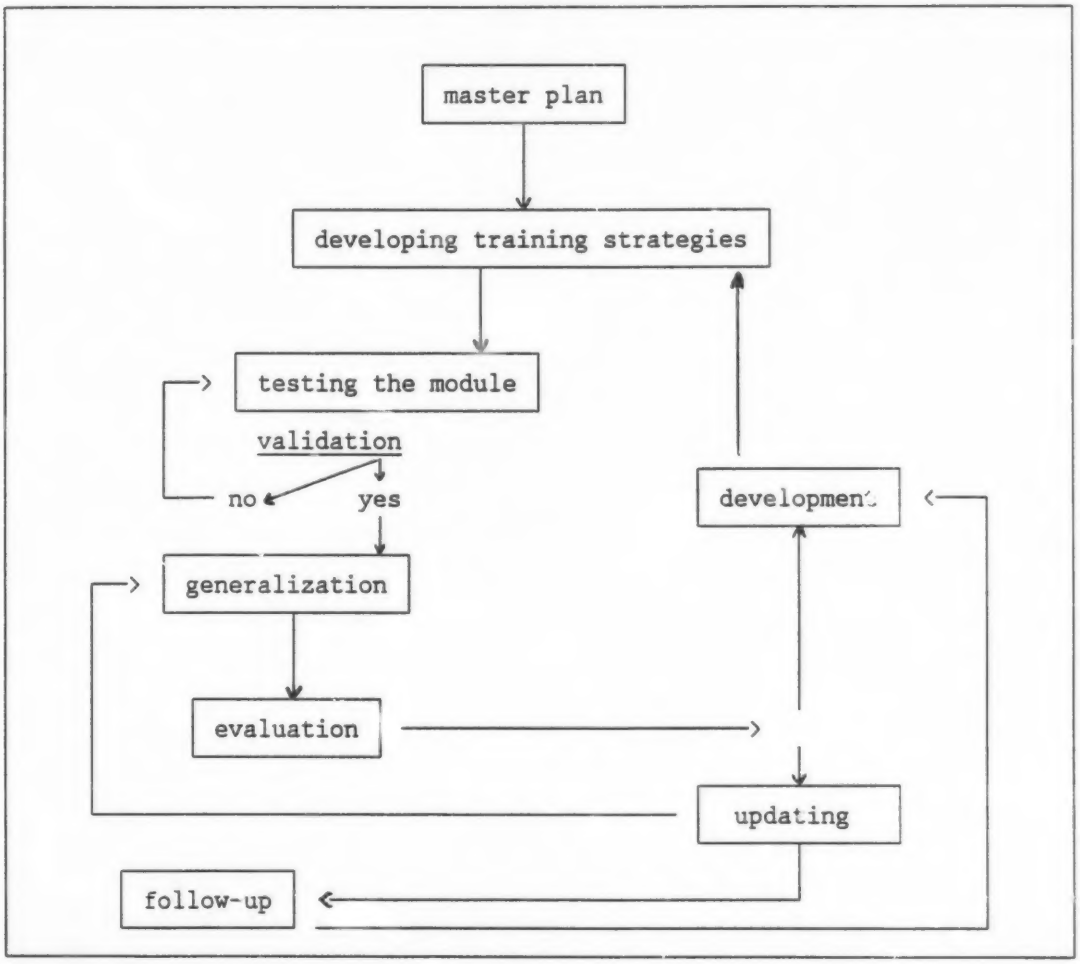
Updating training modules and developing new courses will make it necessary to call upon new resources, either inside or outside the organization. One of the major responsibilities of the training manager is to keep abreast of practices in other organizations with respect to OA training and to identify new potential resources capable of supporting it.

As we can see in Table X, testing a training module, although it comes at the end of a long process, is not yet the final step. On the contrary, the dynamics of training continue: once the module has been validated, it must be generalized. But the on-going evaluation process will lead to both frequent updating and the development of additional modules inspired by new training strategies. Follow-up will also affect these dynamics, both in terms of updating and in the development of new training modules, and thus the cycle continues.

This is a dynamic process, moving back and forth between present and future, as shown in Table X below:

TABLE X

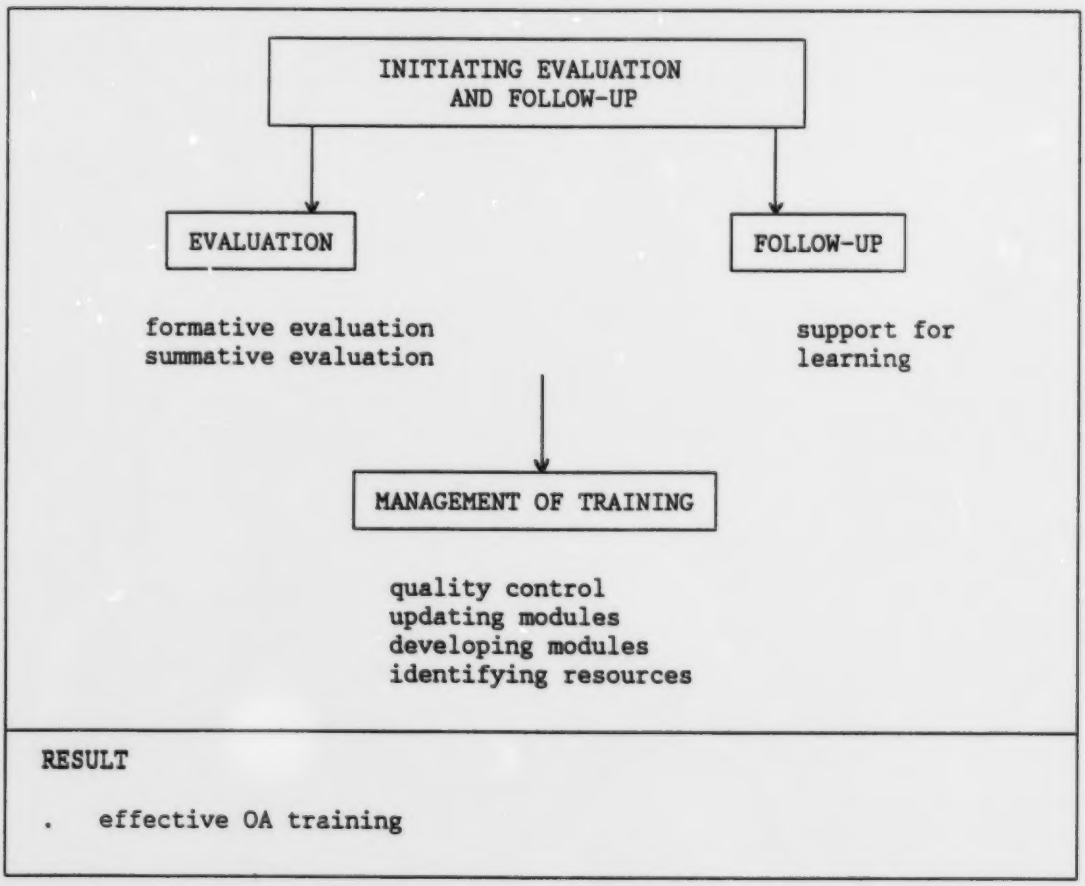
Dynamics of training



The diagram below illustrates the procedure we have followed during this fourth and final phase:

TABLE XI

PHASE IV: Implementing the training process



CONCLUSION

TRAINING, A QUESTION OF CORPORATE CULTURE

Our intention, in this guide, was to consider the field of OA training as a whole. This area is becoming increasingly complex as the rapid technological development currently going on is constantly bringing new dimensions to it. Training nevertheless remains an indispensable condition for any successful work automation project.

We have suggested some concrete steps aimed at facilitating the implementation of an effective training program. Some critics may say that this is an ideal approach that is easier to describe than to apply, and this is no doubt the case. But the important point here is that training must be implemented in the most systematic manner possible, taking into account the constraints particular to each organization's situation.

We have purposely limited our work to OA training. The reader in search of a broader tool may refer to the office automation implementation guide[1], by Jean-Paul Cassar, Louis Garceau, and Thérèse Baribeau or the Guide méthodologique d'implantation de la bureautique published by Les Publications du Québec in 1987. These guides cover all the stages involved in an office automation project.

In concluding this guide, we must emphasize the fact that the importance an organization places on training depends, in the final analysis, on its experience, values and overall approach. The concept of "corporate culture" is a popular one today, and the organization's policy on training is just one manifestation of this culture.

We are obliged to admit that, in North America, corporate cultures in general normally do not value training within the organization very highly.

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[1] Jean-Paul E. Cassar, Louis G. Garceau and Thérèse Baribeau, La bureautique : planification, implantation, gestion, le guide de l'entreprise. Boucherville; Paris : Editions G. Vermette, Editions d'organisation, 1988, 392 p.

Even today, many managers feel that training should precede employment and be received once and for all in the school system. Among those who do accept the idea of continuing education, very few recognize it as the responsibility of the organization. In short, most managers consider training a luxury on which the least possible amount of money should be spent. In this area, Canada is well behind the European countries[2] and far behind Japan.

This trend cannot be corrected overnight, since culture is a phenomenon that evolves slowly. People everywhere are nevertheless coming to realize that organizational productivity is not just a question of tools and work methods, but that human resources are a determining factor and that training in the workplace is necessary to obtain competent employees. The magazine Information et bureautique ran a special feature on training in its December 1987 issue, including an editorial entitled "Training is essential and costs nothing". Throughout our discussion, we have stressed the importance of considering training not as an expense, but as an investment.

This change in thinking can only be achieved if those responsible for training show that it can be profitable. This is necessary if training is to improve its own lot, while bringing about a change in the culture of the organization of which it is part.

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[2] On this subject, readers might consult the report by Antoine Riboud to the prime minister of France, entitled Modernisation, mode d'emploi (Paris: Union générale d'éditions, 1987, 213 p.)

SCHEDULE A

List of persons interviewed (March-May 1987)

Stanley ALEONG *	Free-lance consultant (now with Teleglobe Canada)
Pauline BARRIERE	Training adviser C.G.I. (now with A.S.I. Canada)
Olivar BELLEY	Assistant Manager, User Services Laurentian Bank of Canada
Mario BUZZANGA Denis GUIMOND	Regional Manager Training Adviser Staff Development Branch Public Service Commission of Canada
Jean-Paul CASSAR	President Jean-Paul Cassar & Associés Ltée
Jean-Berthold DESROSIERS Dominique ARSENAULT	Director Training Adviser Groupe CIBLE Ste-Croix School Commission
Michel DION	Head, Training and Development Section University of Montreal
Pierre GAGNON Jean-Pierre TURGEON	Manager Manager, Educational Programs Informatique MultiHexa Inc.
Hélène FOUCAULT	Counsellor, Training and Development Office Automation and Information Management Centre Collège de Bois de Boulogne

* Mr. Aleong was also consulted for Part II of this document.

List of persons interviewed (cont'd.)

André GIRARD	Office Automation Adviser National Bank of Canada (Now president of Gesfor ad hoc)
Diane JACOB	Training Adviser L'Industrielle-Alliance
Gilles PARENT André ROBICHAUD	Project Co-ordinator Analyst, Head of Training Unit Infocentre, City of Montreal
Robert ROY	Trainer La Puce Communautaire, Montreal Inc.
Brigitte TREMBLAY	Supervisor, Customer Services AES DATA Inc.

SCHEDULE B

The twelve principles of OA training

1. Training must be an integral part of all phases of the implementation process.
2. Training should improve both individual skills and organizational performance.
3. Training should be as much concerned with the social and organizational dimension of office automation as with its technological aspects.
4. Training must deal with the person as a whole: knowledge, skills and attitudes.
5. Training should be based on a conceptual approach and provide an understanding that goes beyond simple manipulation.
6. Training should be relevant to participants' actual work requirements.
7. Training should be supplemented by both technological and functional follow-up.
8. Training should tailor teaching methods and resources to the various objectives pursued and types of clientele.
9. Training should be dispensed by competent instructors who are informed about participants' job-related duties.
10. Training must be allocated sufficient resources in terms of time, space and equipment.
11. Training should be allocated financial resources equal to the budget for equipment.
12. Training should be systematically evaluated to establish its effectiveness based on objective criteria.